

FIG.1

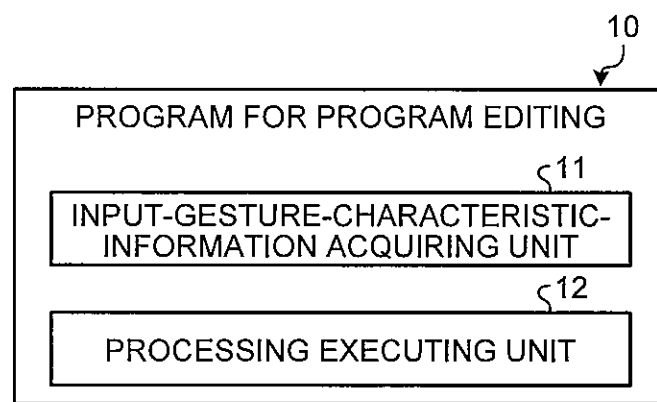
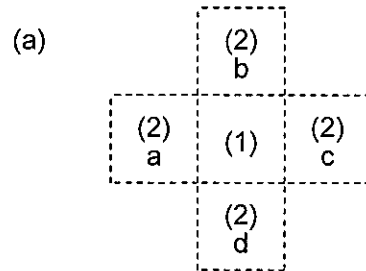


FIG.2



(b)

TRACK AND DIRECTION	OPERATION TARGET	DEFINITION OF TRACK AND DIRECTION*	COMMAND
←	SYMBOL-LOCATABLE BASE ELEMENT	(1)→(2)a	NEGLECT
↑		(1)→(2)b	NEGLECT
→		(1)→(2)c	REPLACE BASE ELEMENT WITH CONNECTION LINE IN HORIZONTAL DIRECTION HOWEVER, WHEN OTHER PROGRAM CONSTITUENT ELEMENT IS ABSENT BETWEEN CONNECTION LINE AND BUSES, REPLACE REGION BETWEEN LEFT BUS AND RIGHT BUS WITH CONNECTION LINE
↓		(1)→(2)d	WHEN OTHER PROGRAM CONSTITUENT ELEMENT IS ABSENT BETWEEN CONNECTION LINE AND BUSES, REGION BETWEEN LEFT BUS AND RIGHT BUS IS REPLACED WITH CIRCUIT INCLUDING "a" CONTACT, COIL, AND CONNECTION LINE

* PLACE START POINT IN (1), PLACE END POINT IN (2), AND COLLATE DIRECTION

FIG.3

(a)

(2) ab	(2) b	(2) bc
(2) a	(1)	(2) c
(2) ad	(2) d	(2) cd

(b)

TRACK AND DIRECTION	OPERATION TARGET	DEFINITION OF TRACK AND DIRECTION*	COMMAND
←	SYMBOL-LOCATABLE BASE ELEMENT	(1)→(2)a	NEGLECT
↑		(1)→(2)b	NEGLECT
→		(1)→(2)c	REPLACE BASE ELEMENT WITH CONNECTION LINE IN HORIZONTAL DIRECTION HOWEVER, WHEN OTHER PROGRAM CONSTITUENT ELEMENT IS ABSENT BETWEEN CONNECTION LINE AND BUSES, REPLACE REGION BETWEEN LEFT BUS AND RIGHT BUS WITH CONNECTION LINE
↓		(1)→(2)d	WHEN OTHER PROGRAM CONSTITUENT ELEMENT IS ABSENT BETWEEN CONNECTION LINE AND BUSES, REGION BETWEEN LEFT BUS AND RIGHT BUS IS REPLACED WITH CIRCUIT INCLUDING "a" CONTACT, COIL, AND CONNECTION LINE
↖		(1)→(2)ab	NEGLECT
↗		(1)→(2)bc	NEGLECT
↘		(1)→(2)cd	NEGLECT
↙		(1)→(2)ad	NEGLECT

* PLACE START POINT IN (1), PLACE END POINT IN (2), AND COLLATE DIRECTION

FIG.4

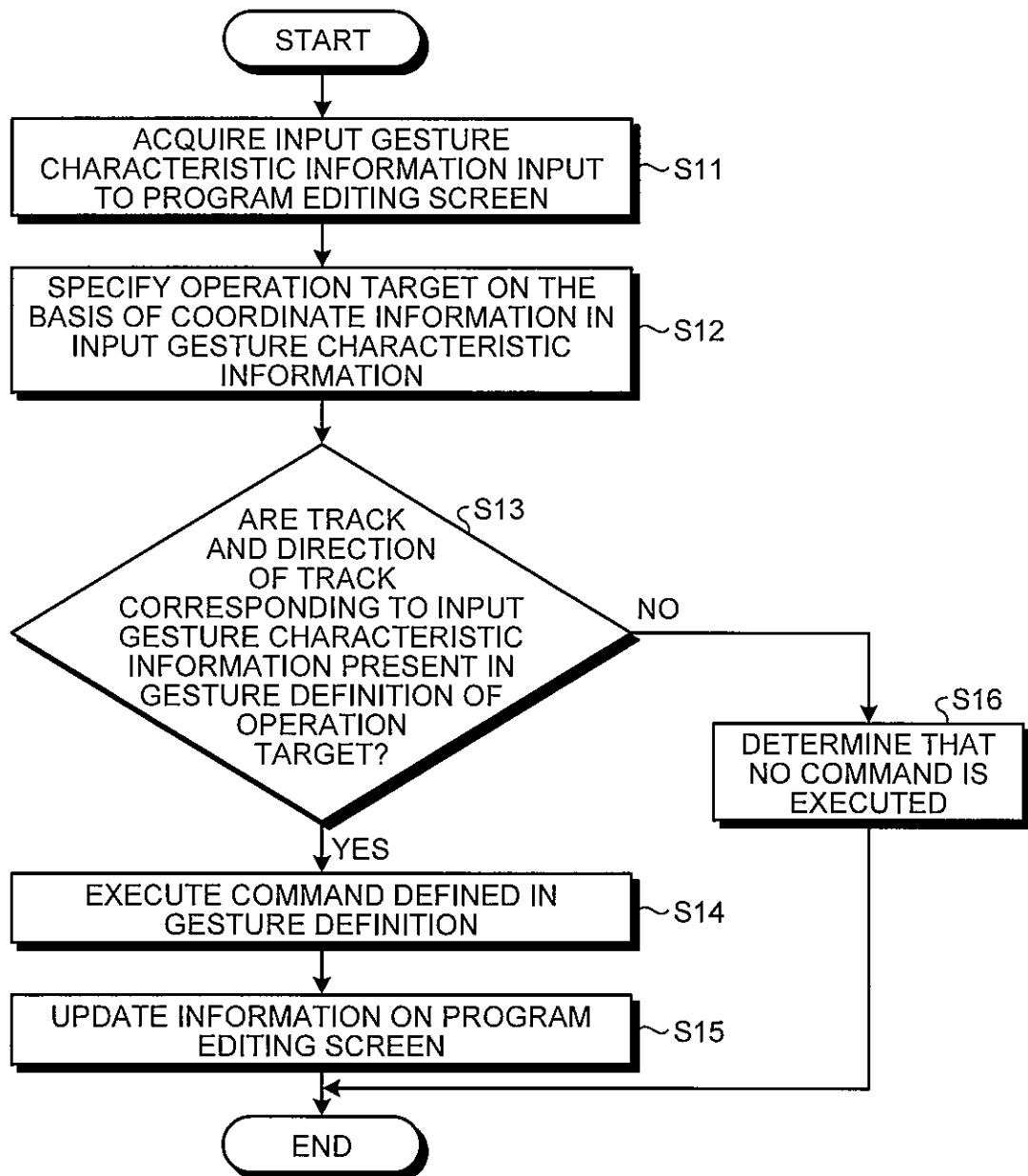


FIG.5

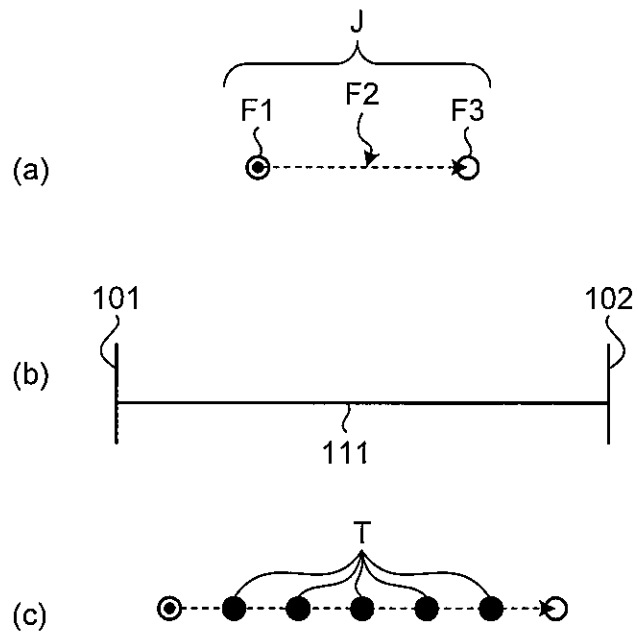


FIG.6

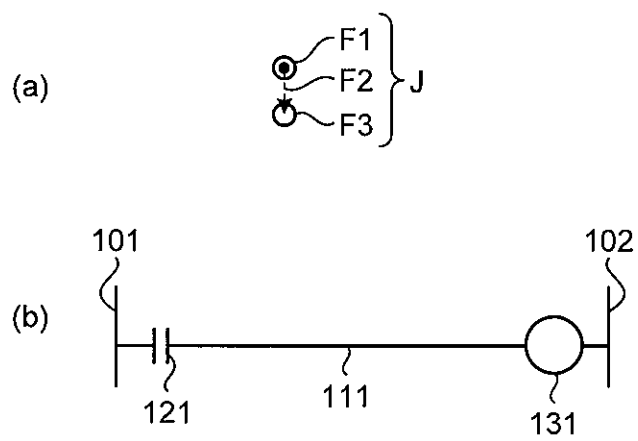


FIG.7

TRACK AND DI- RECTION	OPERATION TARGET	DEFINITION OF TRACK AND DIRECTION	COMMAND
	SYMBOL- LOCATABLE BASE ELEMENT	(1)→(2)a	NEGLECT
		(1)→(2)b	NEGLECT
		(1)→(2)c	REPLACE BASE ELEMENT WITH CONNECTION LINE IN HORIZONTAL DIRECTION HOWEVER, WHEN OTHER PROGRAM CONSTITUENT ELEMENT IS ABSENT BETWEEN CONNECTION LINE AND BUSES, REPLACE REGION BETWEEN LEFT BUS AND RIGHT BUS WITH CONNECTION LINE
		(1)→(2)d	NEGLECT
:	:	:	:
		(1)→(2)a	NEGLECT
		(1)→(2)b	REPLACE CONSTITUENT ELEMENT WITH 
		(1)→(2)d	REPLACE CONSTITUENT ELEMENT WITH 
		(1)→(2)ad	REPLACE CONSTITUENT ELEMENT WITH 
		(2)ab→(1)→(2)cd→(2)d →(2)ad→(1)→(2)bc	CUT OFF CONSTITUENT ELEMENT
		(2)bc→(2)c→(2)d→(2)a →(2)ab	DELETE CONSTITUENT ELEMENT
:	:	:	:
		(1)→(2)ad	REPLACE CONSTITUENT ELEMENT WITH 
:	:	:	:
	CONNEC- TION LINE	(1)→(2)d	REPLACE CONSTITUENT ELEMENT WITH 
		(1)→(2)b	REPLACE CONSTITUENT ELEMENT WITH 
		(2)b→(2)c→(2)d	REPLACE CONSTITUENT ELEMENT WITH 
		(2)a→(1)→(2)c→(2)cd	REPLACE CONSTITUENT ELEMENT WITH INSTRUCTION FRAME
		(2)a→(2)ad, (1)→(2)d	REPLACE CONSTITUENT ELEMENT WITH 
		(2)a→(1)→(2)c→(2)bc	REPLACE CONSTITUENT ELEMENT WITH 
		(2)c→(1)→(2)a→(2)ab	REPLACE CONSTITUENT ELEMENT WITH 
		(2)ab→(2)a→(1)→(2)c →(2)bc	REPLACE CONSTITUENT ELEMENT WITH 
:	:	:	:
	INSTRUC- TION FRAME	(1)→(2)d	REPLACE CONSTITUENT ELEMENT WITH 
:	:	:	:

FIG.8

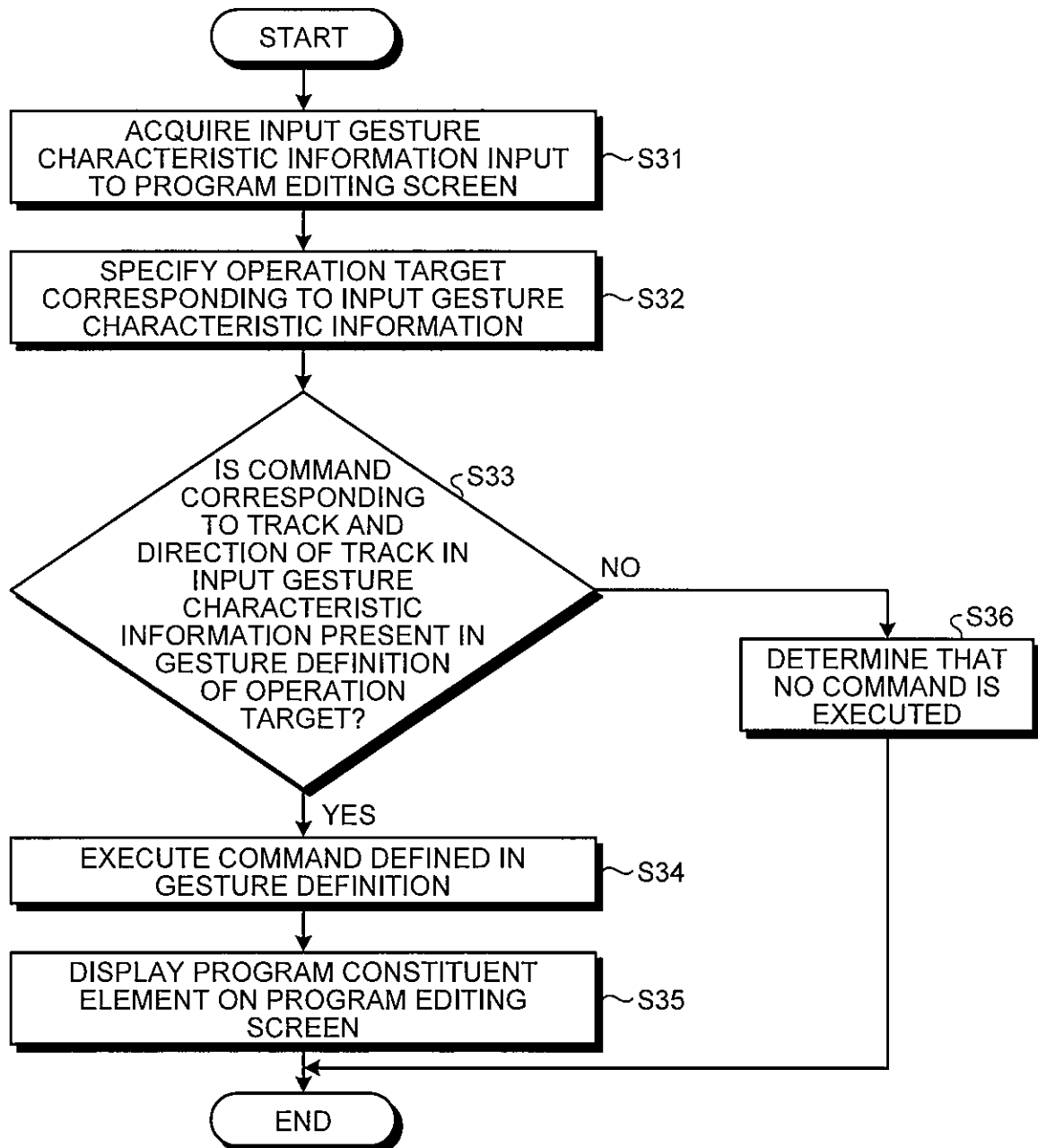


FIG.9

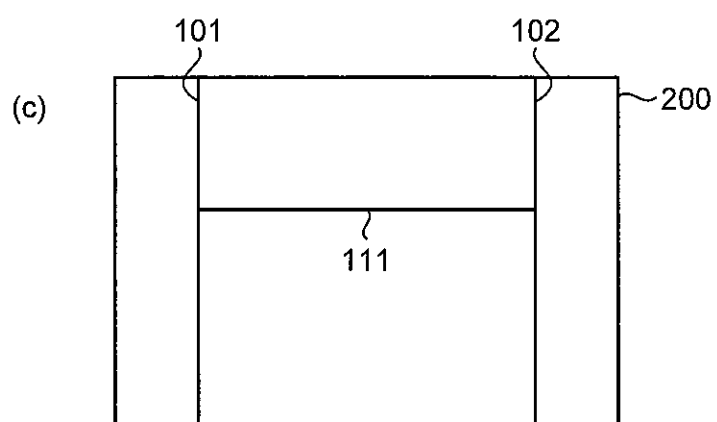
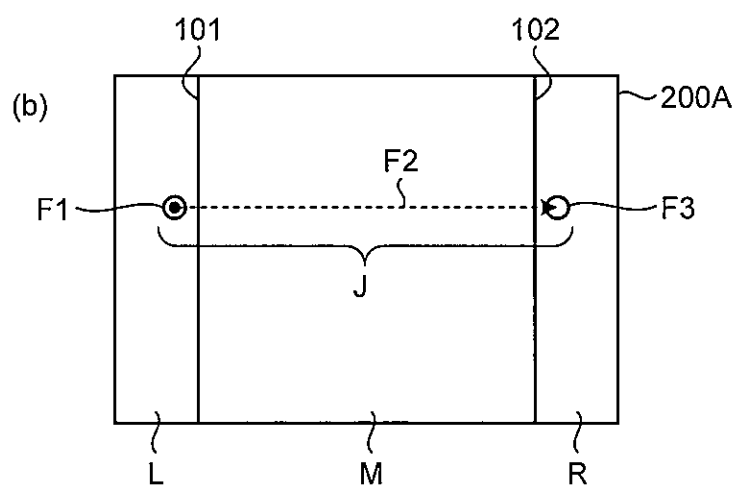
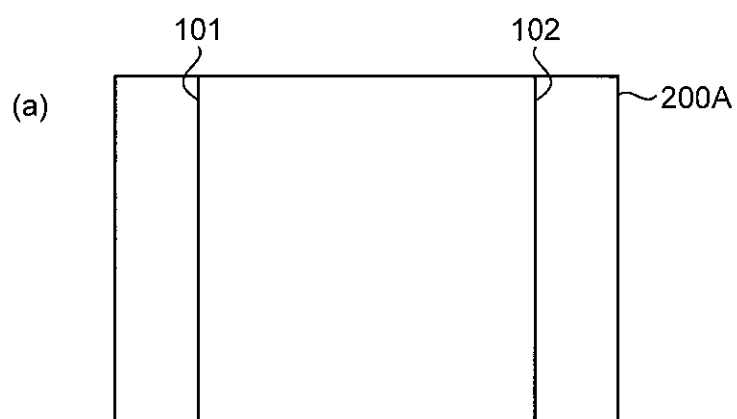


FIG.10

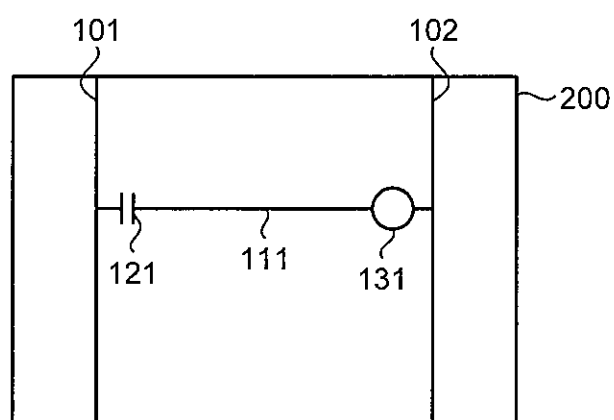


FIG.11

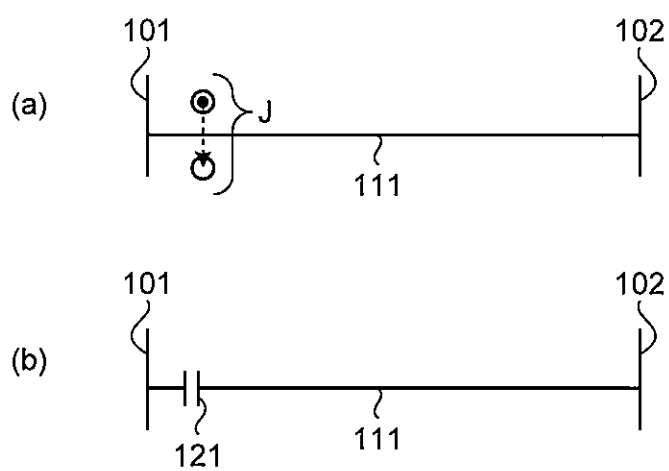


FIG.12

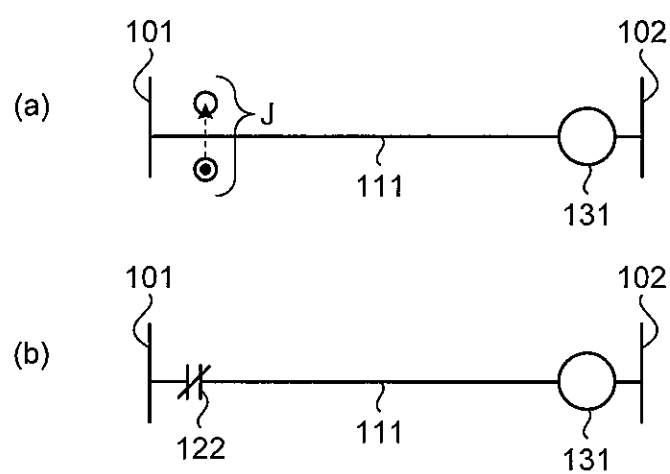


FIG.13

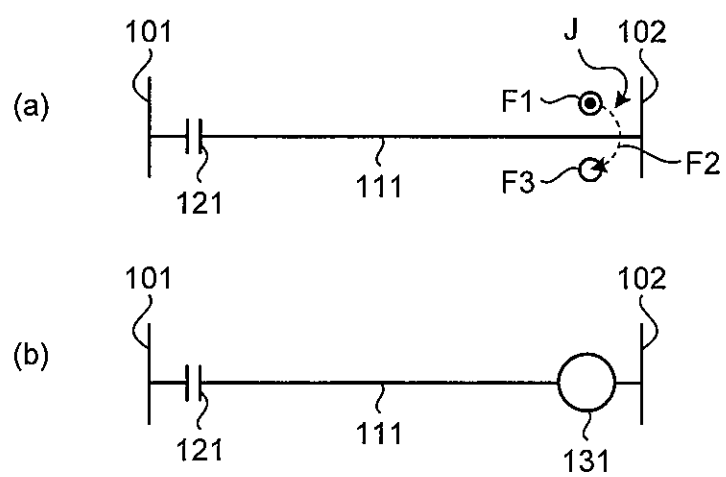


FIG.14

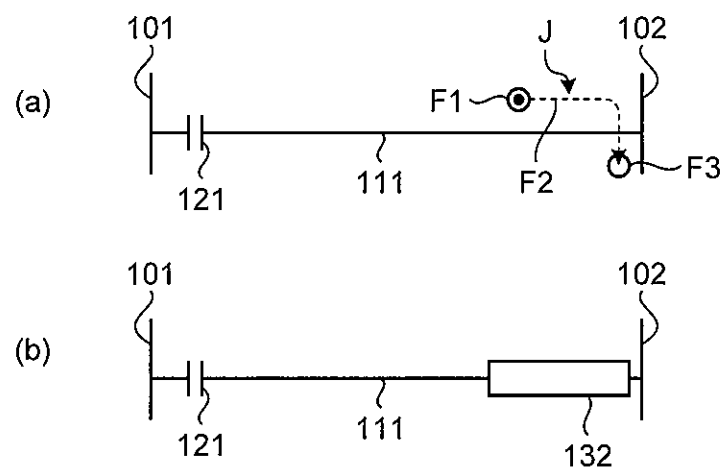


FIG.15

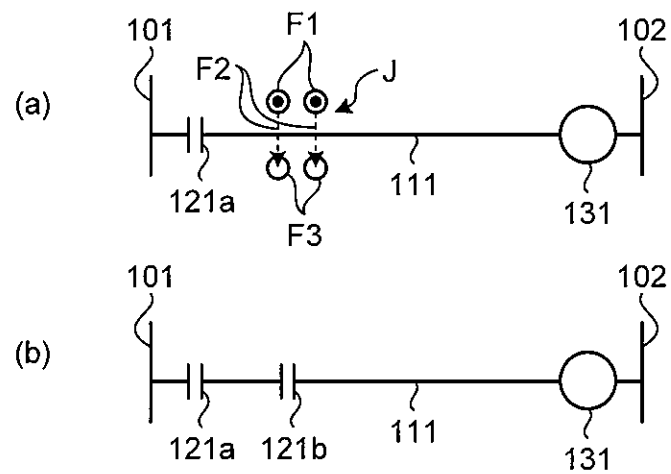


FIG.16

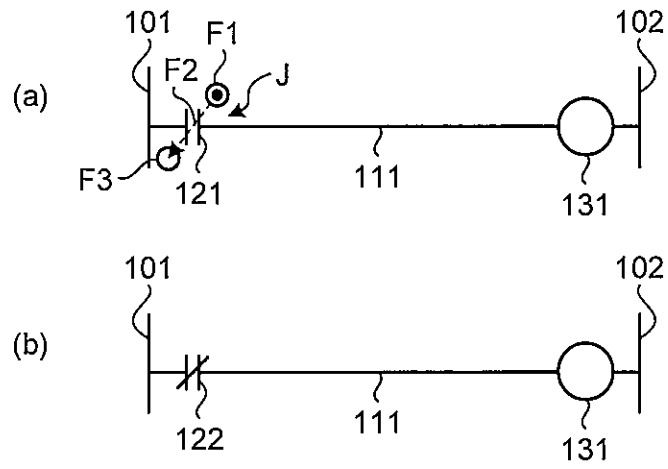


FIG.17

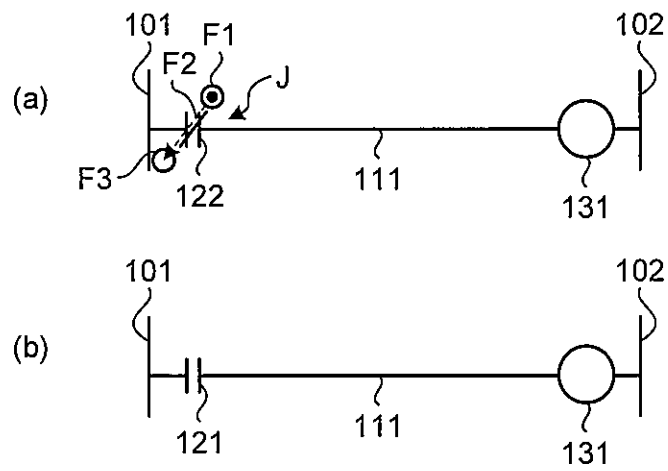


FIG.18

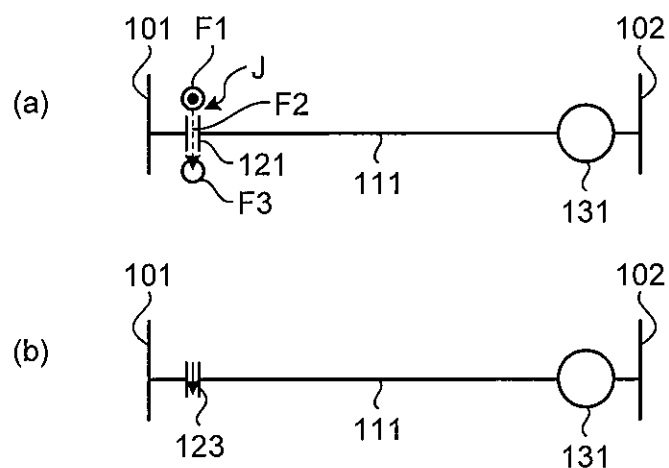


FIG.19

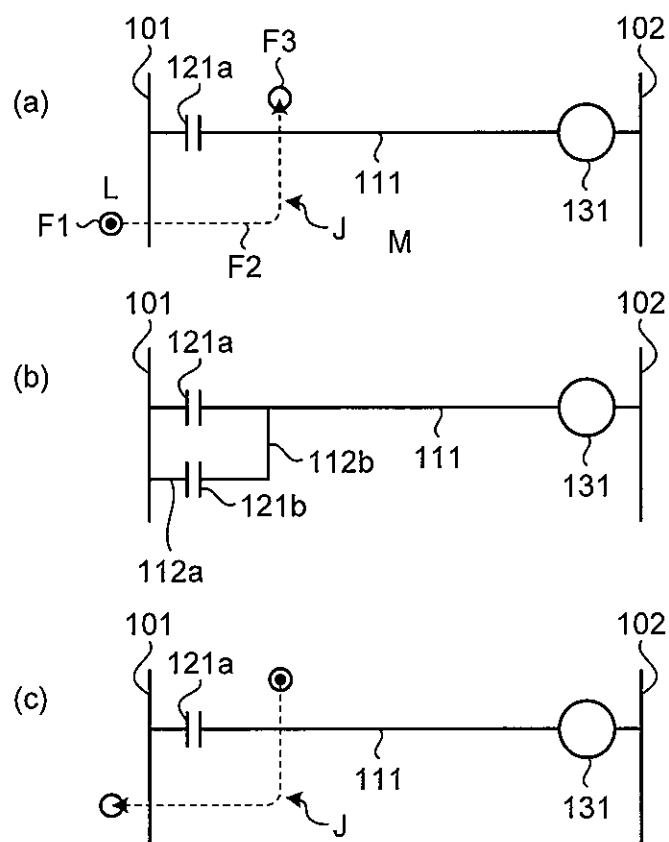


FIG.20

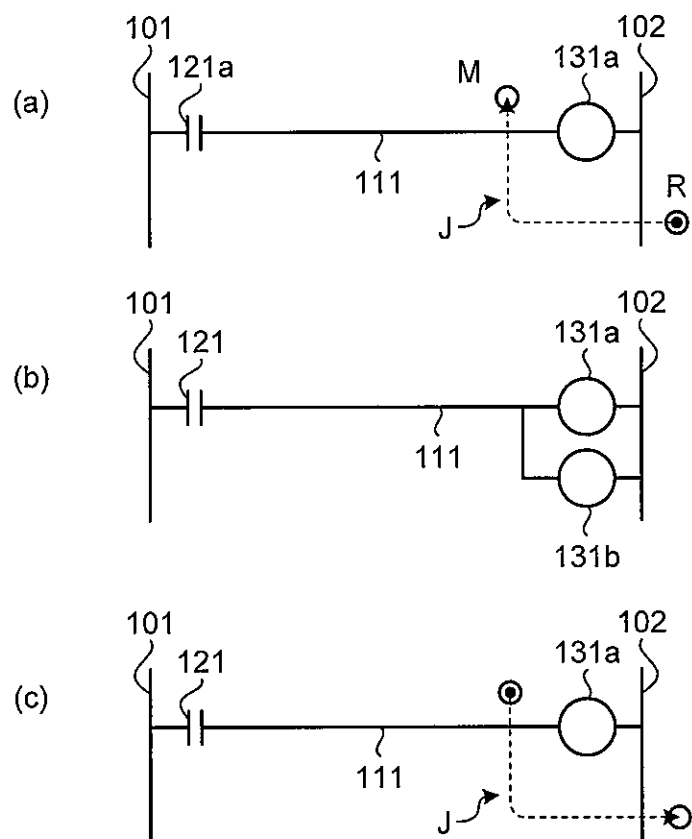


FIG.21

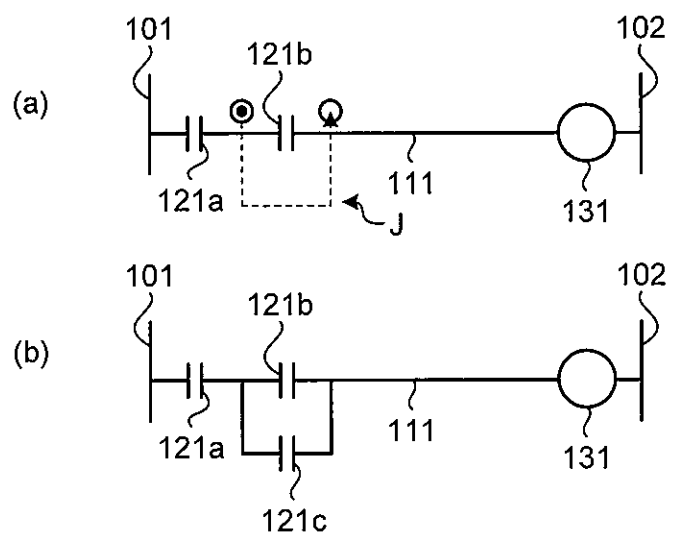


FIG.22

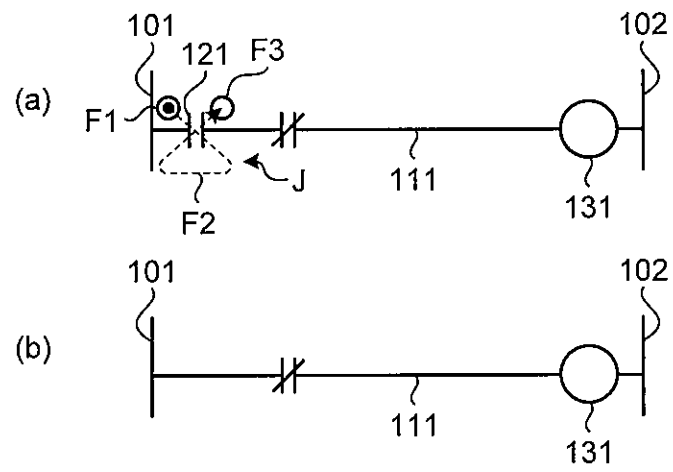


FIG.23

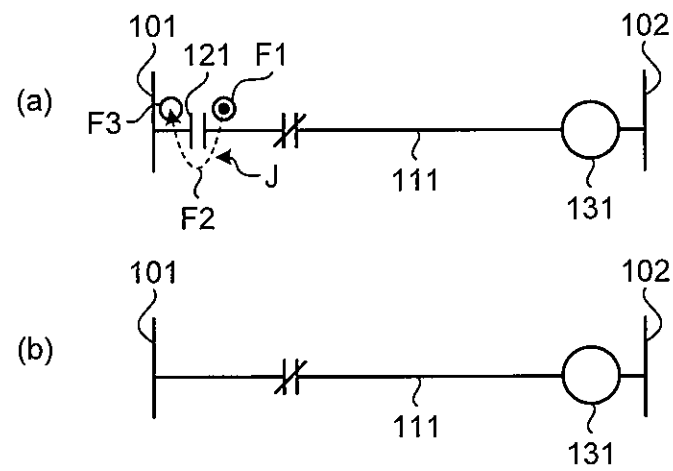


FIG.24

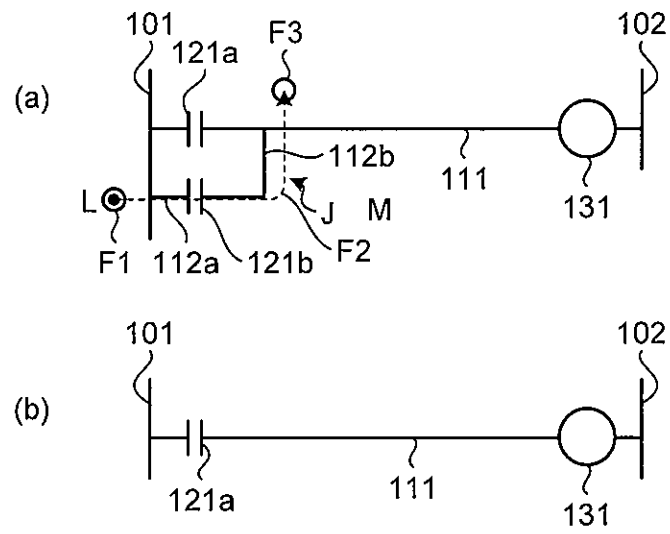


FIG.25

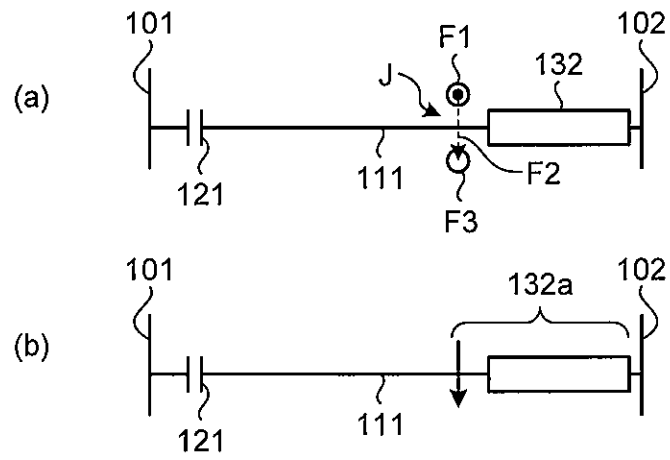


FIG.26

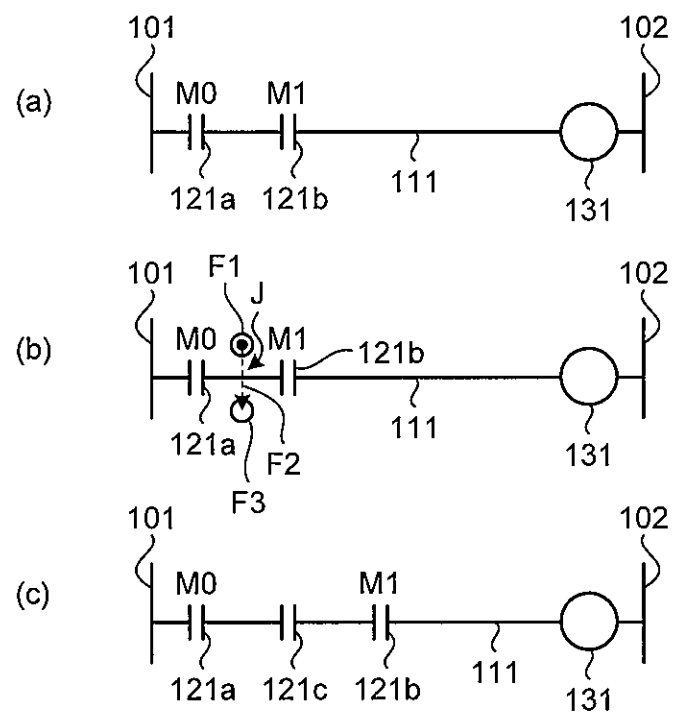


FIG.27

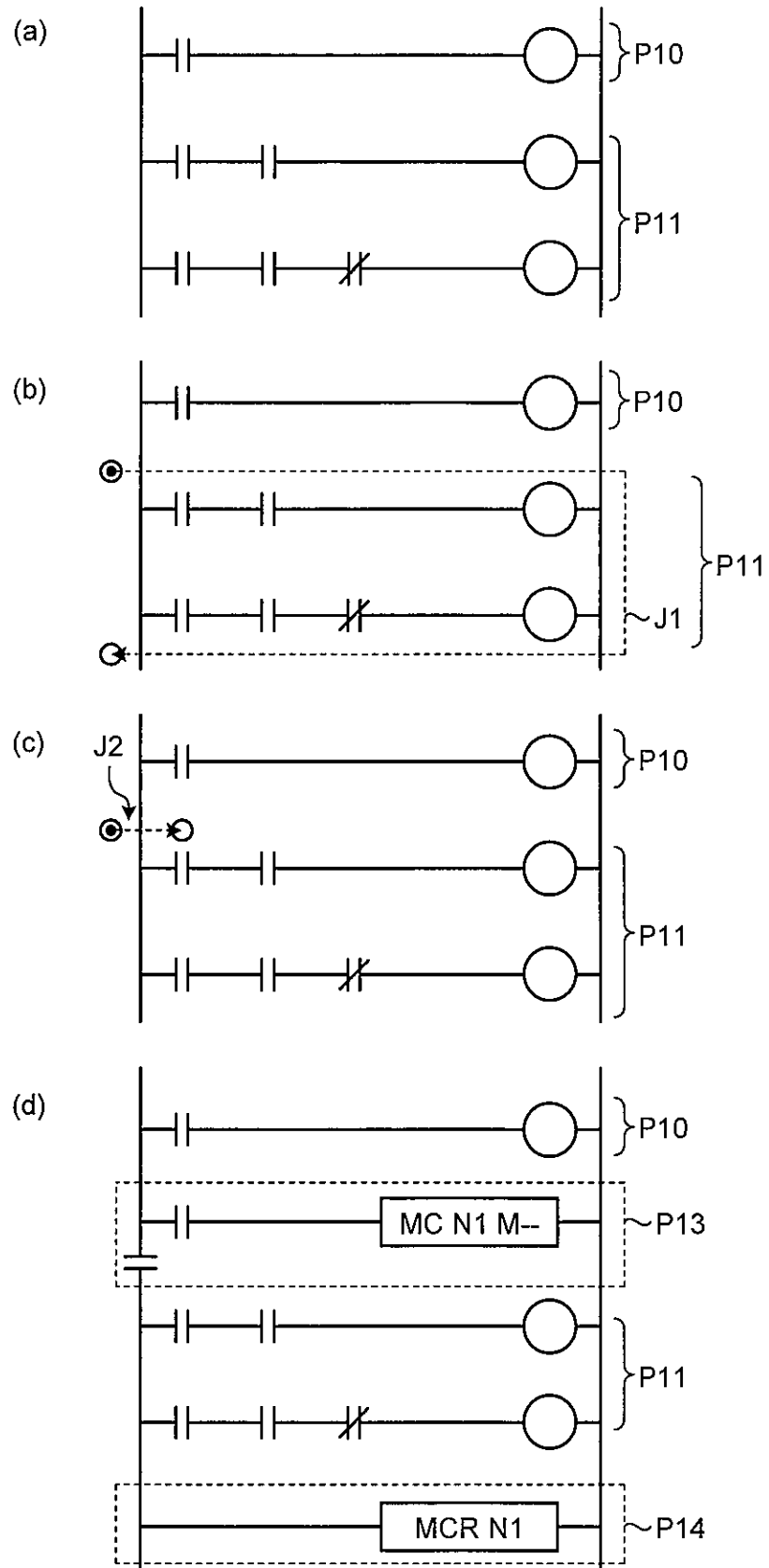


FIG.28

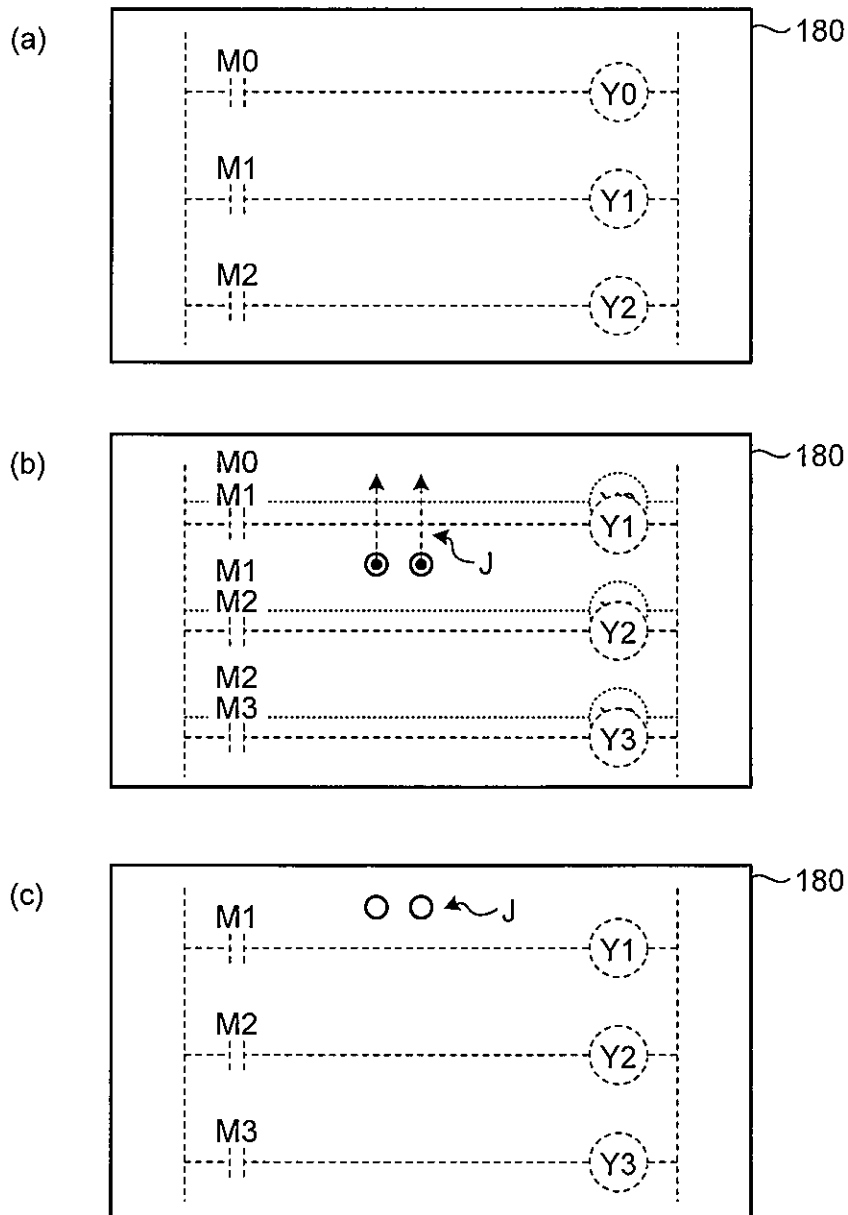


FIG.29

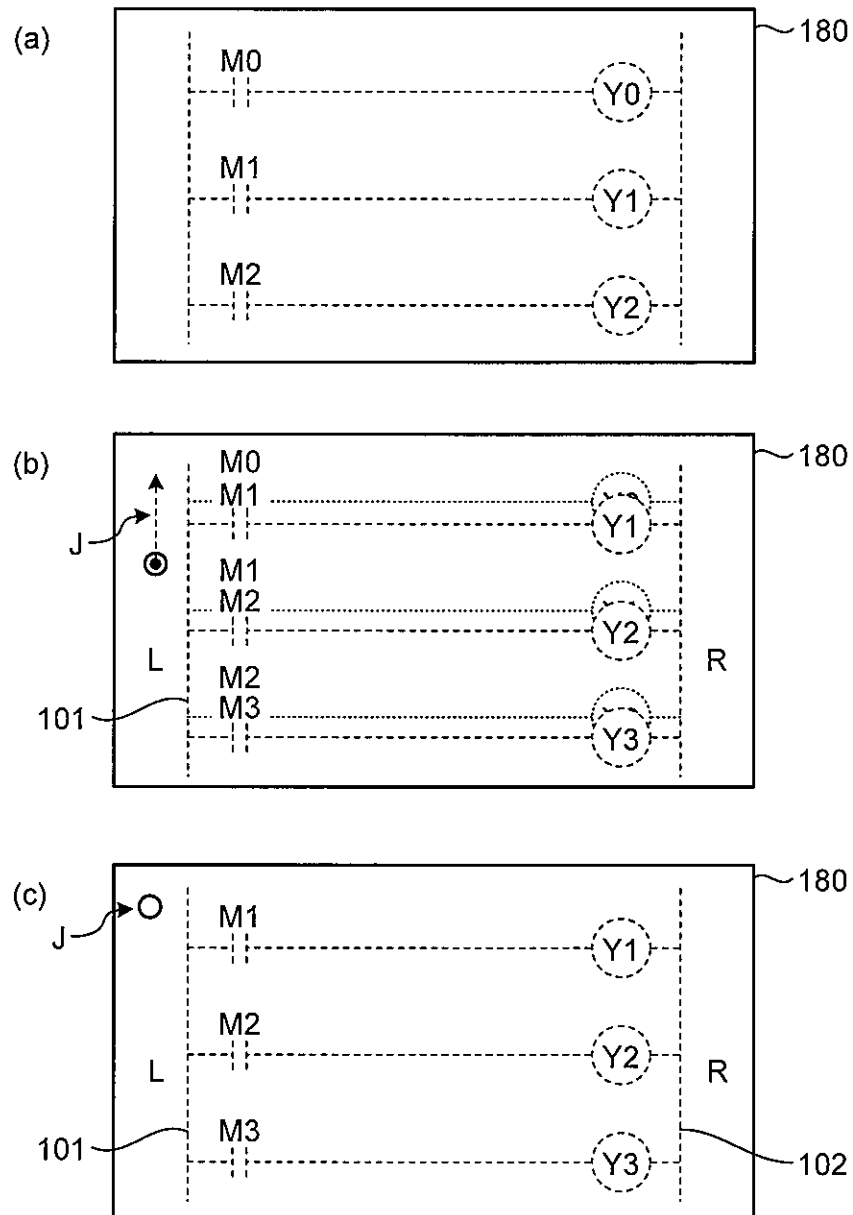


FIG.30

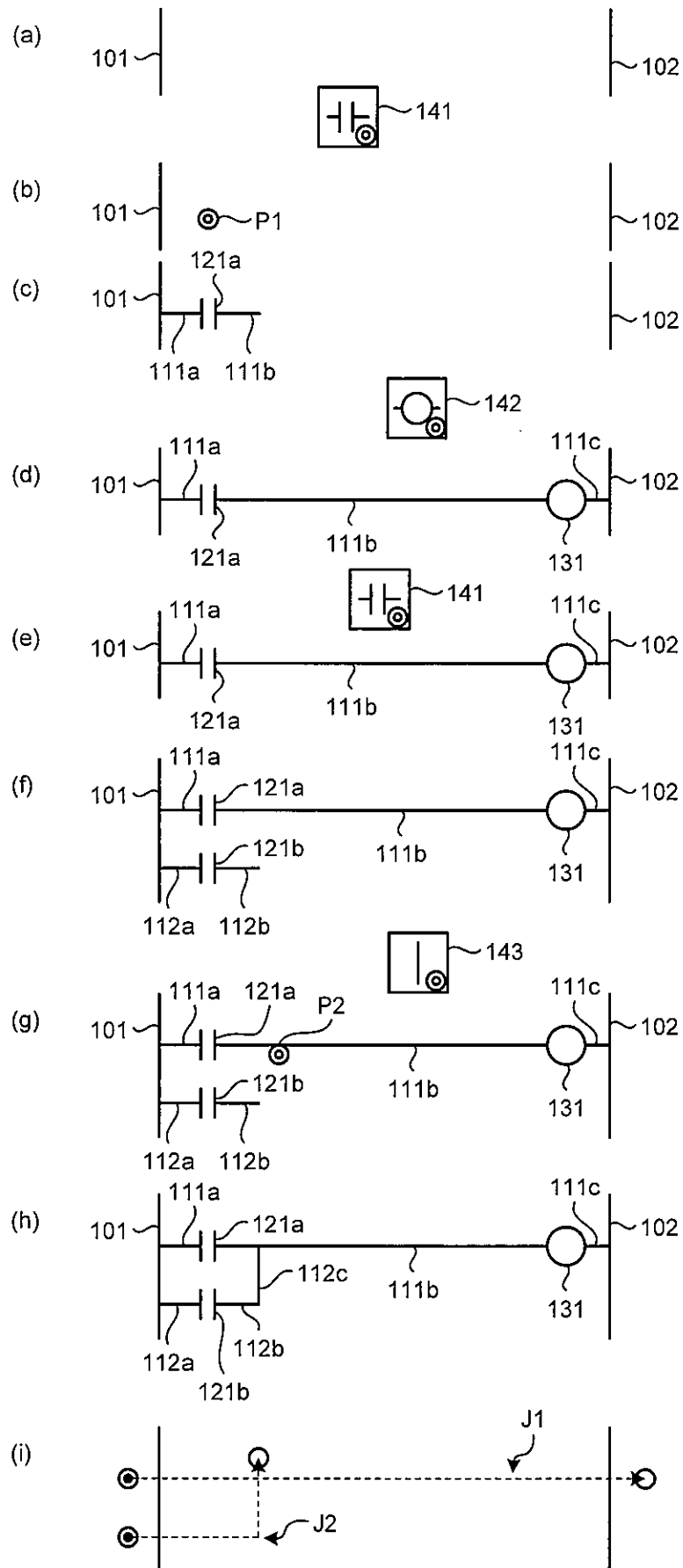
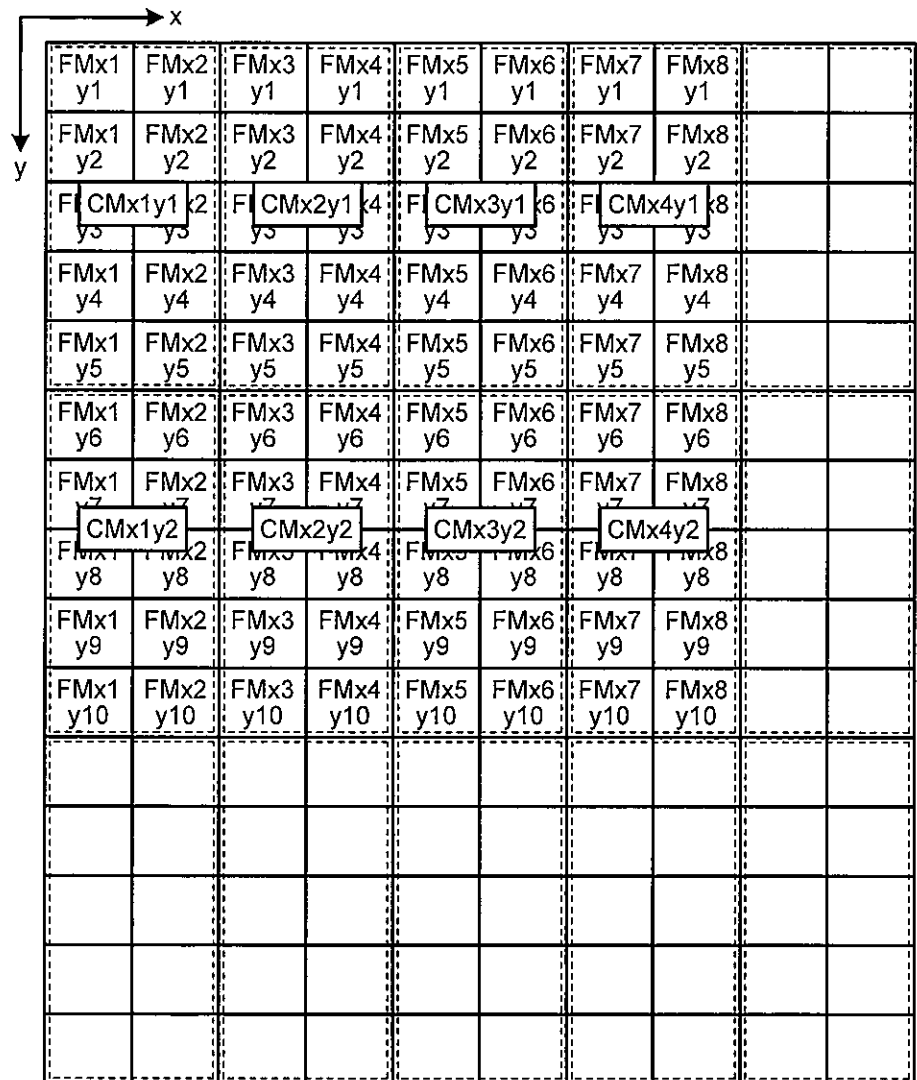


FIG.31

(a)



(b)

COARSE REGION	DETAILED REGION	COORDINATE RANGE
CMx1y1	FMx1y1	(x1,y1):(x10,y10)
	FMx2y1	(x11,y1):(x20,y10)
	FMx1y2	(x1,y11):(x10,y20)
	FMx2y2	(x11,y11):(x20,y20)
	FMx1y3	(x1,y21):(x10,y30)
	FMx2y3	(x11,y21):(x20,y30)
	FMx1y4	(x1,y31):(x10,y40)
	FMx2y4	(x11,y31):(x20,y40)
	FMx1y5	(x11,y41):(x10,y50)
	FMx2y5	(x11,y41):(x20,y50)
CMx2y1	FMx3y1	(x21,y1):(x30,y10)
	FMx4y1	(x31,y1):(x40,y10)
	⋮	⋮
	⋮	⋮
	⋮	⋮
	⋮	⋮

FIG.32

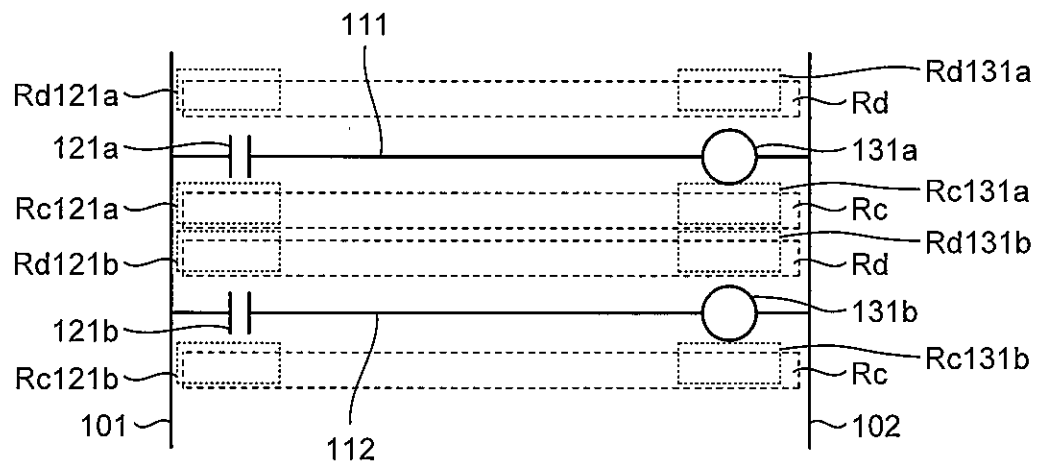


FIG.33

(a)	(2) ab	(2) b	(2) bc
	(2) a	(1)	(2) c
	(2) ad	(2) d	(2) cd

(b)	(62) ab	(62) b	(62) bc	(32) ab	(32) b	(32) bc	(72) ab	(72) b	(72) bc
	(62) a	(61)	(62) c	(32) a	(31)	(32) c	(72) a	(71)	(72) c
	(62) ad	(62) d	(62) cd	(32) ad	(32) d	(32) cd	(72) ad	(72) d	(72) cd
	(22) ab	(22) b	(22) bc	(12) ab	(12) b	(12) bc	(42) ab	(42) b	(42) bc
	(22) a	(21)	(22) c	(12) a	(11)	(12) c	(42) a	(41)	(42) c
	(22) ad	(22) d	(22) cd	(12) ad	(12) d	(12) cd	(42) ad	(42) d	(42) cd
	(92) ab	(92) b	(92) bc	(52) ab	(52) b	(52) bc	(82) ab	(82) b	(82) bc
	(92) a	(91)	(92) c	(52) a	(51)	(52) c	(82) a	(81)	(82) c
	(92) ad	(92) d	(92) cd	(52) ad	(52) d	(52) cd	(82) ad	(82) d	(82) cd

(c)

OPERATION TARGET		TRACK AND DIRECTION	DEFINITION OF TRACK AND DIRECTION	COMMAND
SYMBOL-LOCATABLE BASE ELEMENT	STANDARD BASE ELEMENT	FOR COARSE REGION	←	(1)→(2)a REPLACE BASE ELEMENT WITH LATERAL RULED LINE
			→	(1)→(2)c REPLACE BASE ELEMENT WITH LATERAL RULED LINE
			⋮	⋮
		FOR DETAILED REGION	↘	(11)→(12)cd→(82)ab →(81)→(82)cd, (42)c→(42)d→(82)ab →(52)c→(52)d
			↙	(11)→(12)cd→(82)ab, (42)c→(42)d→(82)ab →(82)a→(82)ad
			⋮	⋮
	DEVICE NAME INPUT BASE ELEMENT	FOR COARSE REGION	→	(1)→(2)bc STEP 1: OPEN CHARACTER INPUT PANEL AND RECEIVE CHARACTERS INPUT IN CHARACTER INPUT PANEL STEP 2: CASE 1: WHEN TRACKS CANNOT BE RECOGNIZED AS CHARACTERS, PROCEED TO PROCESS FOR COARSE REGION CASE 2: WHEN PROGRAM CONSTITUENT ELEMENT IS ADJACENT TO LOWER SIDE, REGISTER CHARACTERS THEREOF IN DEVICE NAME CASE 3: WHEN NOT CORRESPONDING TO CASE 1, ADD, BY ONE ROW, LADDER PROGRAM HAVING PROGRAM CONSTITUENT ELEMENT CORRESPONDING TO FIRST CHARACTER WHEN CORRESPONDING PROGRAM CONSTITUENT ELEMENT IS ABSENT IN FIRST CHARACTER, NEGLECT
			⋮	⋮
		FOR DETAILED REGION	ALL OTHERS	STEP 1: RECOGNIZE TRACKS AS CHARACTERS STEP 2: CASE 1: WHEN TRACKS CANNOT BE RECOGNIZED AS CHARACTERS, PROCEED TO PROCESS FOR COARSE REGION CASE 2: WHEN PROGRAM CONSTITUENT ELEMENT IS ADJACENT TO LOWER SIDE, REGISTER CHARACTERS THEREOF IN DEVICE NAME CASE 3: WHEN NOT CORRESPONDING TO CASE 1, ADD, BY ONE ROW, LADDER PROGRAM HAVING PROGRAM CONSTITUENT ELEMENT CORRESPONDING TO FIRST CHARACTER WHEN CORRESPONDING PROGRAM CONSTITUENT ELEMENT IS ABSENT IN FIRST CHARACTER, NEGLECT

FIG.34

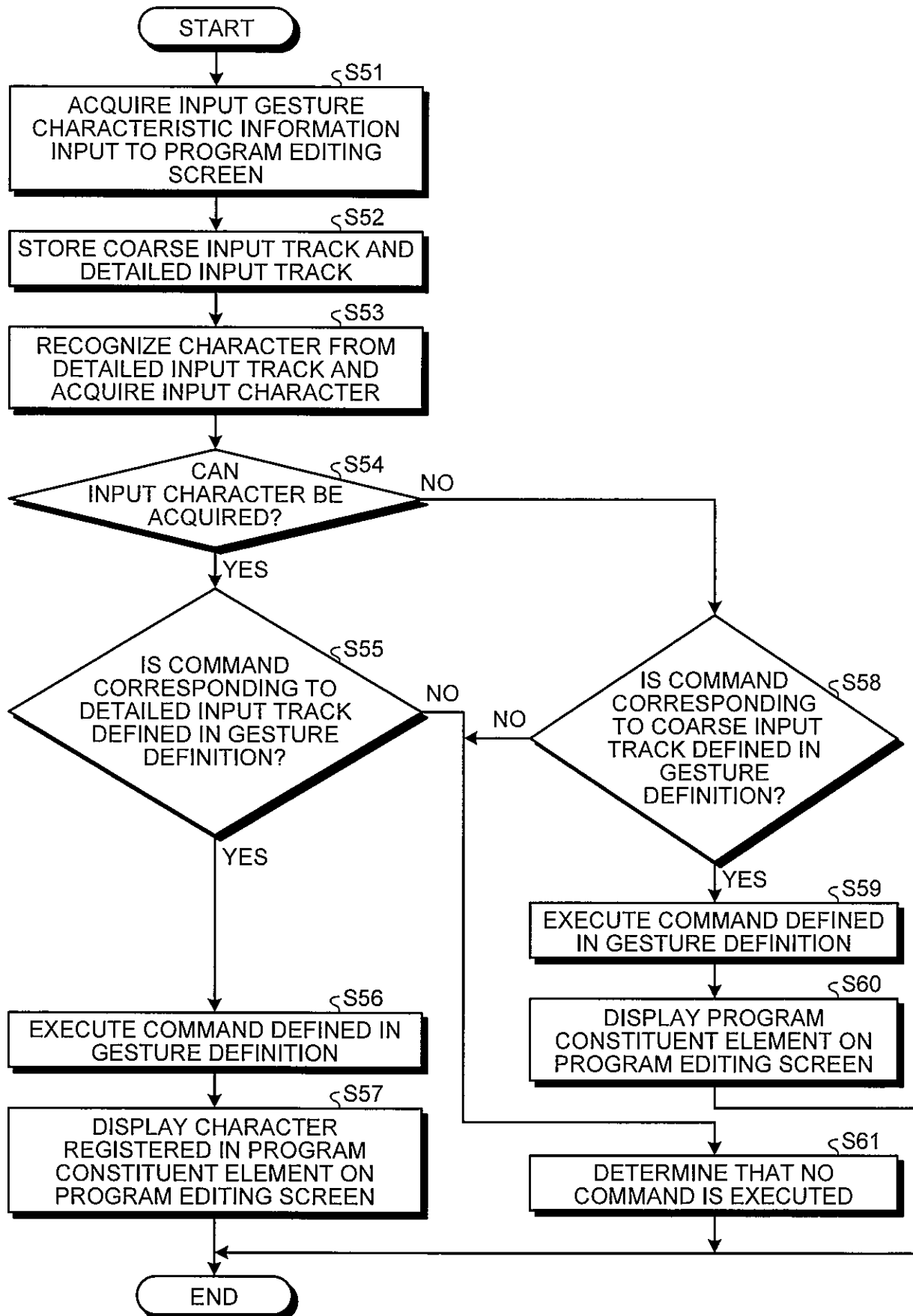


FIG.35

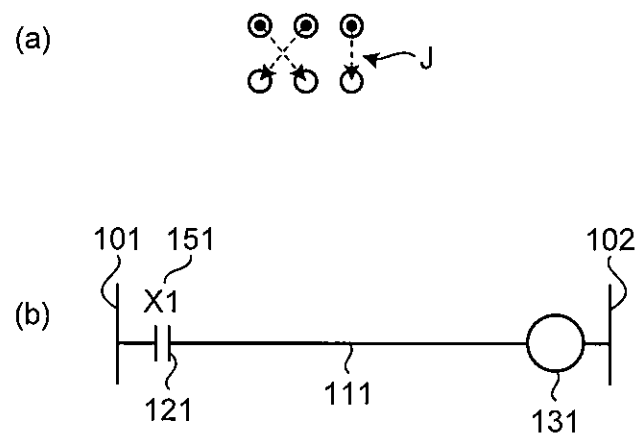


FIG.36

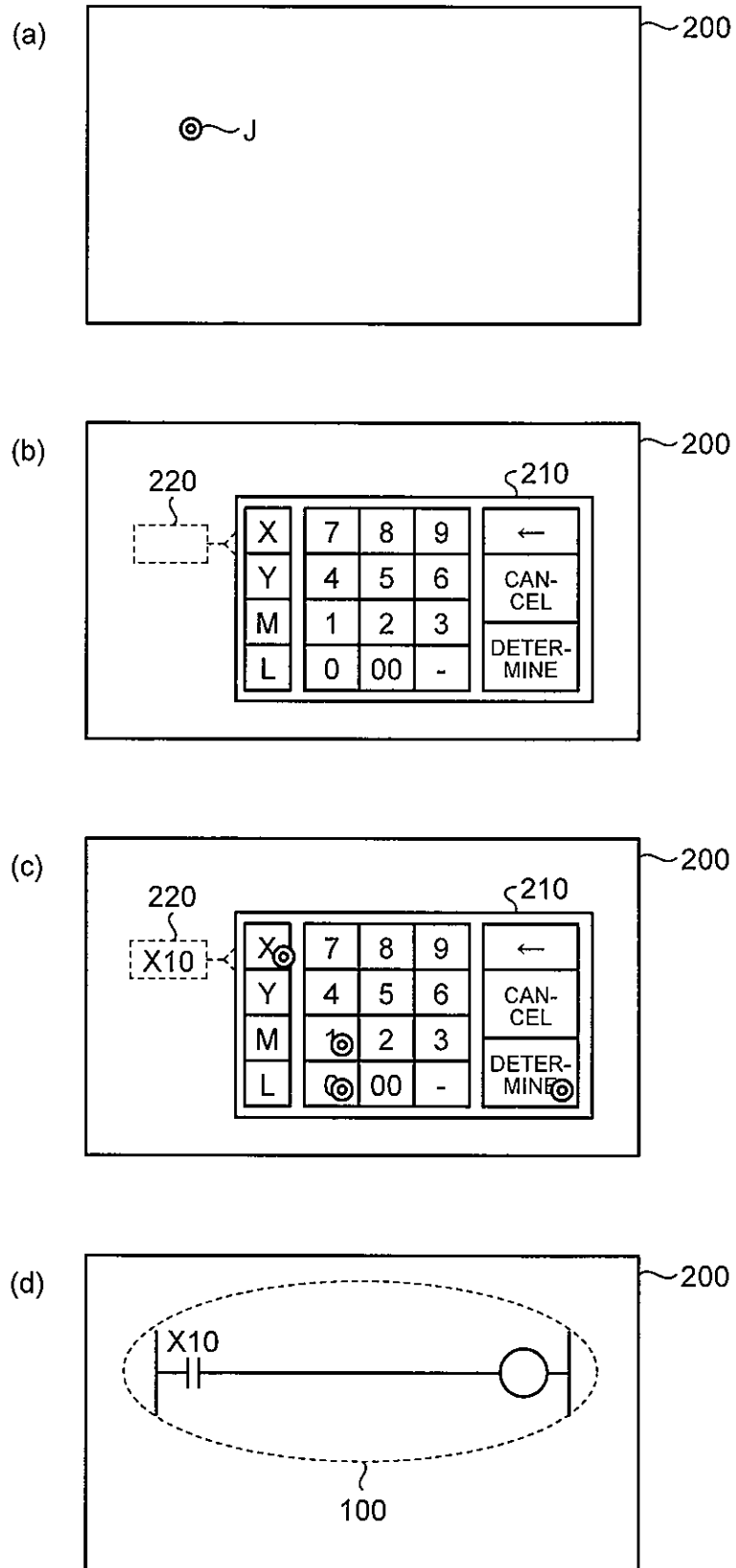


FIG.37

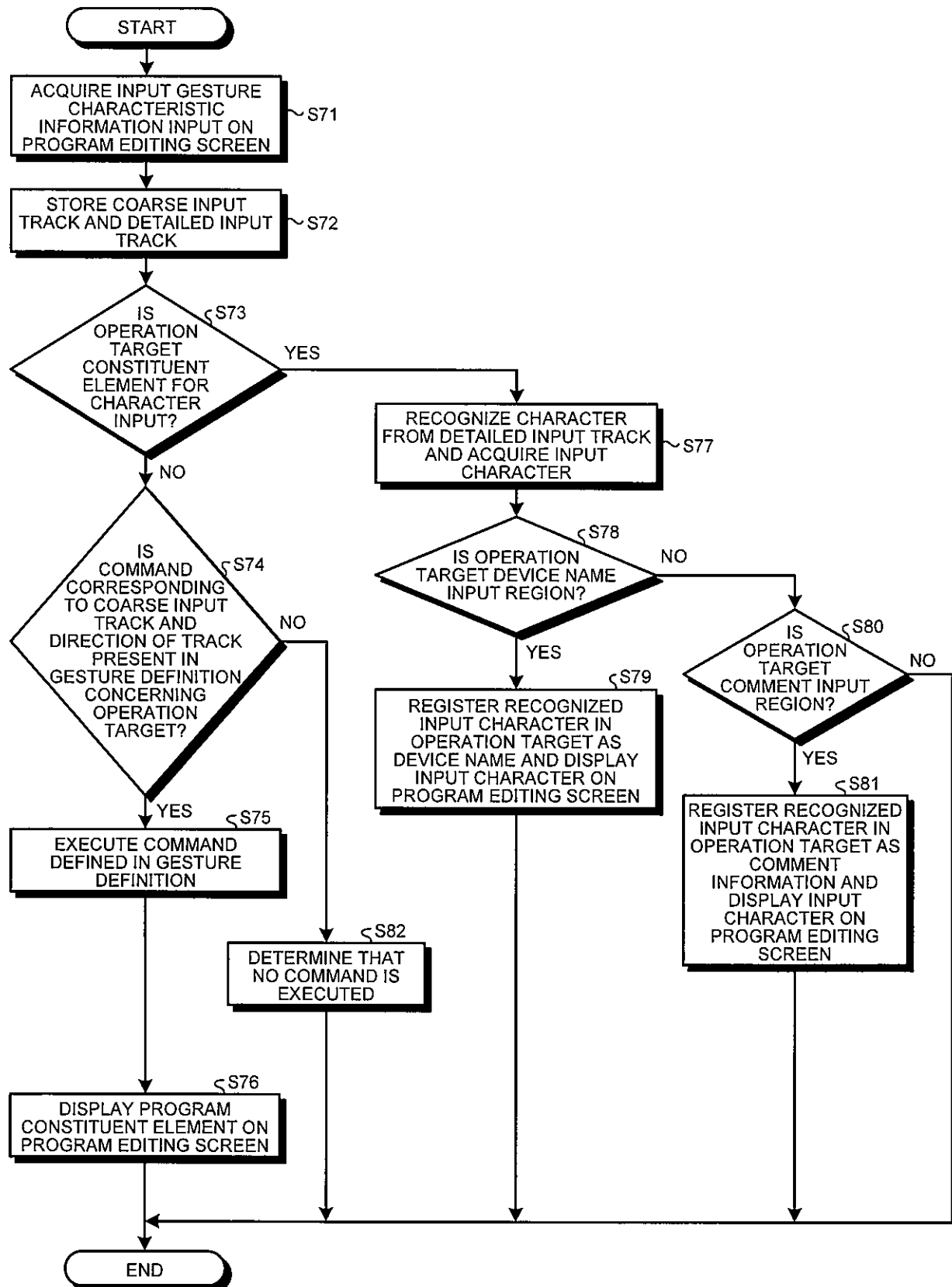


FIG.38

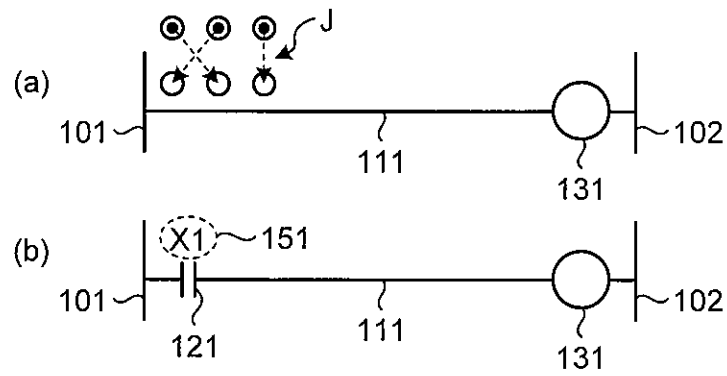


FIG.39

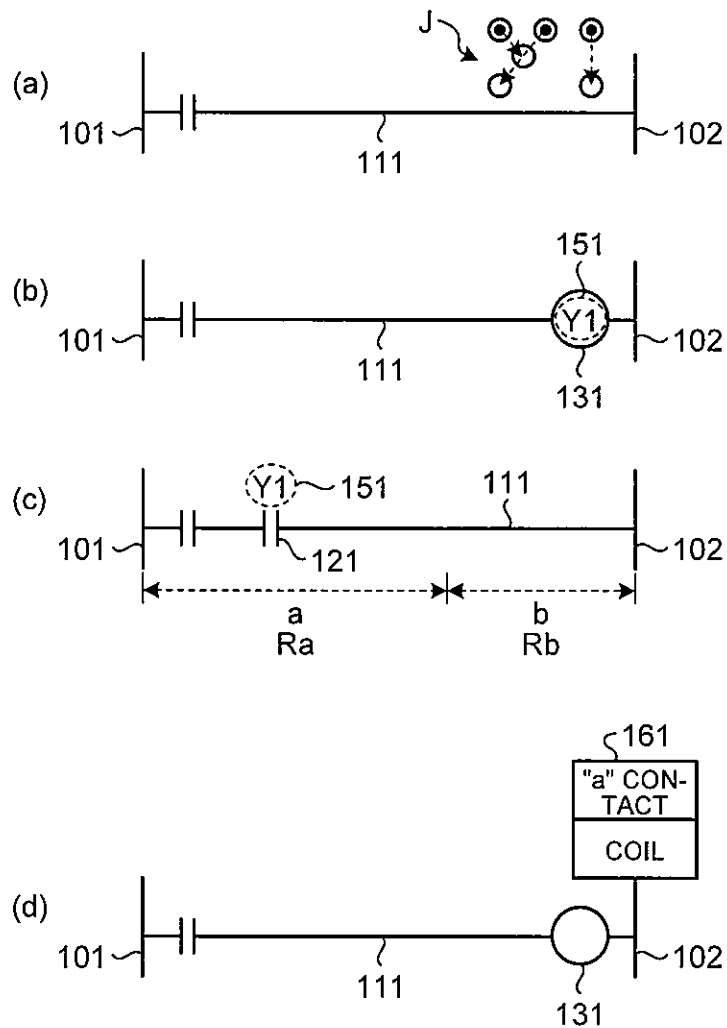


FIG.40

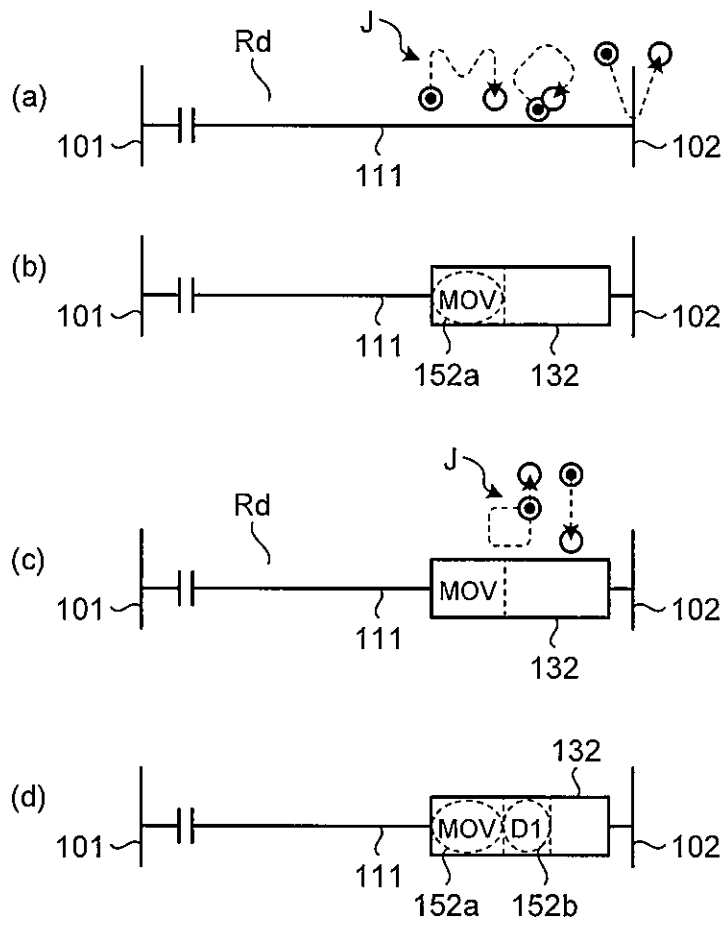


FIG.41

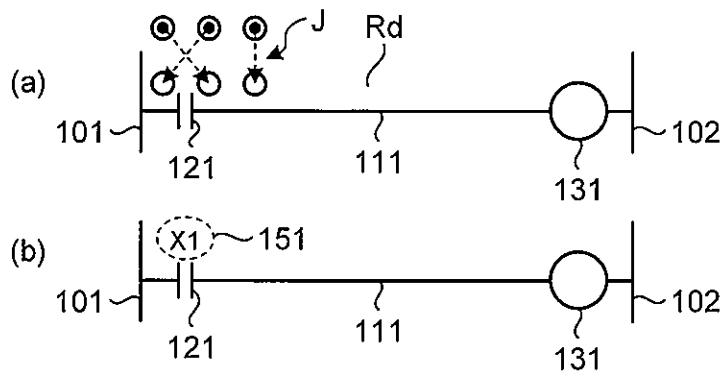


FIG.42

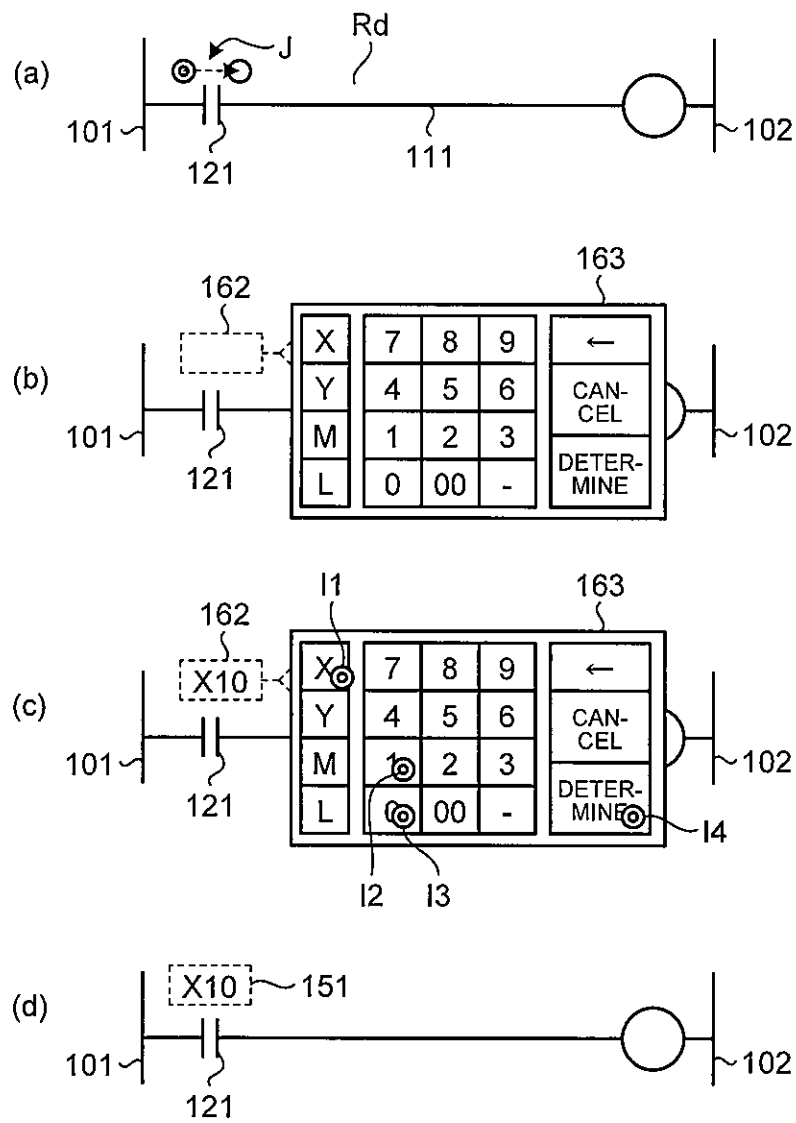


FIG.43

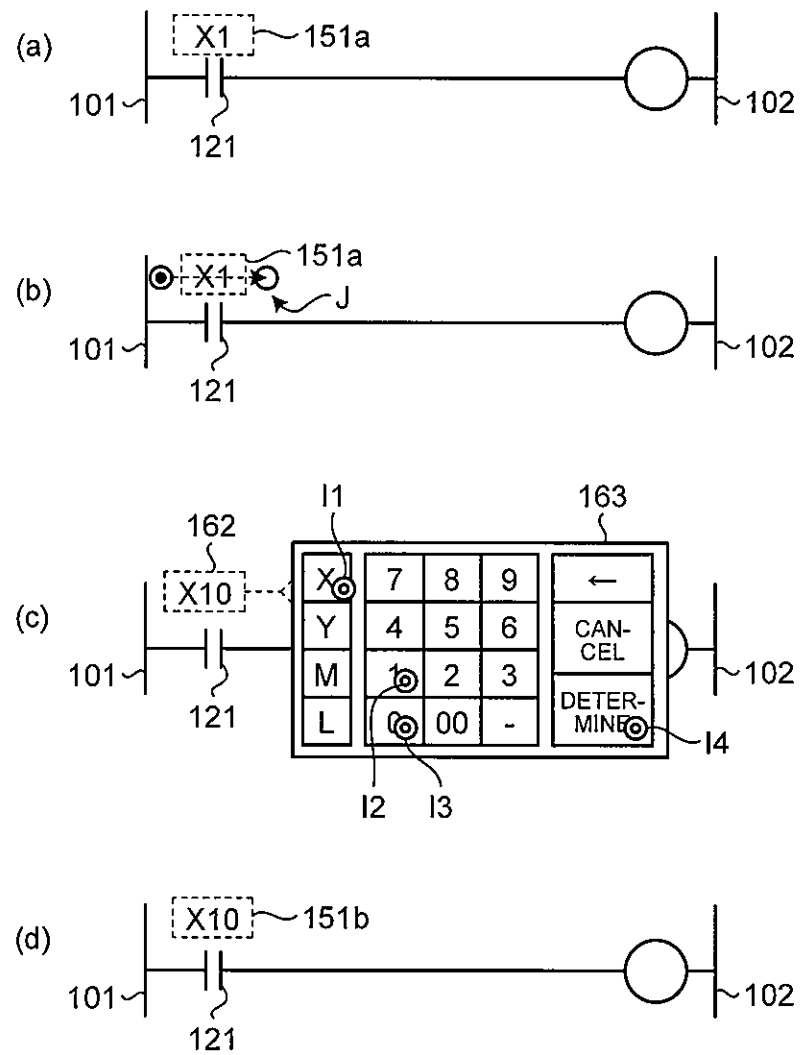


FIG.44

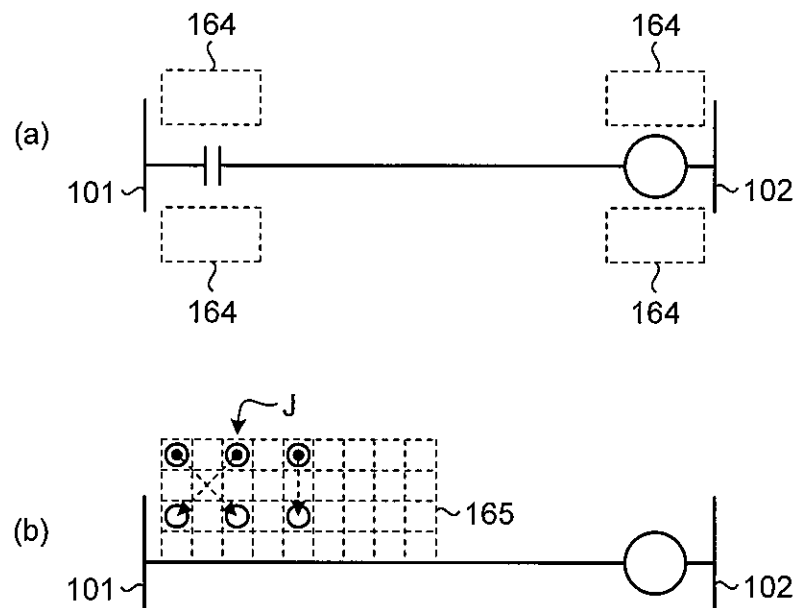
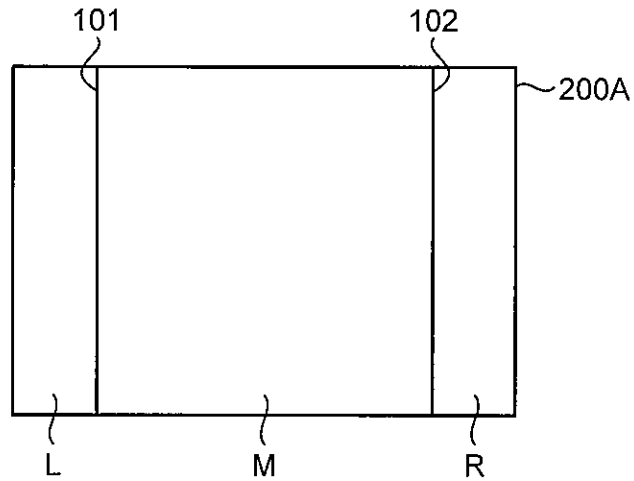


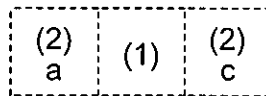
FIG.45



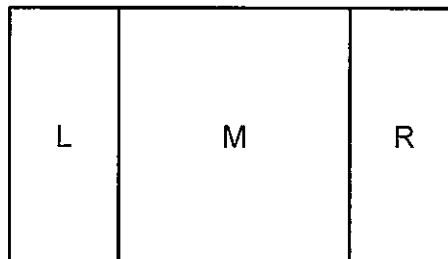
COARSE REGION	DETAILED REGION	COORDINATE RANGE
CMx1y1	FMx1y1	(x1,y1):(x10,y10)
	FMx2y1	(x11,y1):(x20,y10)
	FMx1y2	(x1,y11):(x10,y20)
	FMx2y2	(x11,y11):(x20,y20)
	FMx1y3	(x1,y21):(x10,y30)
	FMx2y3	(x11,y21):(x20,y30)
	FMx1y4	(x1,y31):(x10,y40)
	FMx2y4	(x11,y31):(x20,y40)
	FMx1y5	(x11,y41):(x10,y50)
	FMx2y5	(x11,y41):(x20,y50)
CMx2y1	FMx3y1	(x21,y1):(x30,y10)
	FMx4y1	(x31,y1):(x40,y10)
	⋮	⋮
	⋮	⋮
	⋮	⋮
	⋮	⋮

FIG.46

(a)



(b)



(c)

TRACK AND DI- RECTION	OPERATION TARGET	DEFINITION OF TRACK AND DIRECTION	COMMAND
←	SYMBOL- LOCATABLE BASE ELEMENT	(1)→(2)a	PLACE CONNECTION LINE BETWEEN LEFT BUS AND RIGHT BUS
→		(1)→(2)c	PLACE CONNECTION LINE BETWEEN LEFT BUS AND RIGHT BUS
⋮	⋮	⋮	⋮

FIG.47

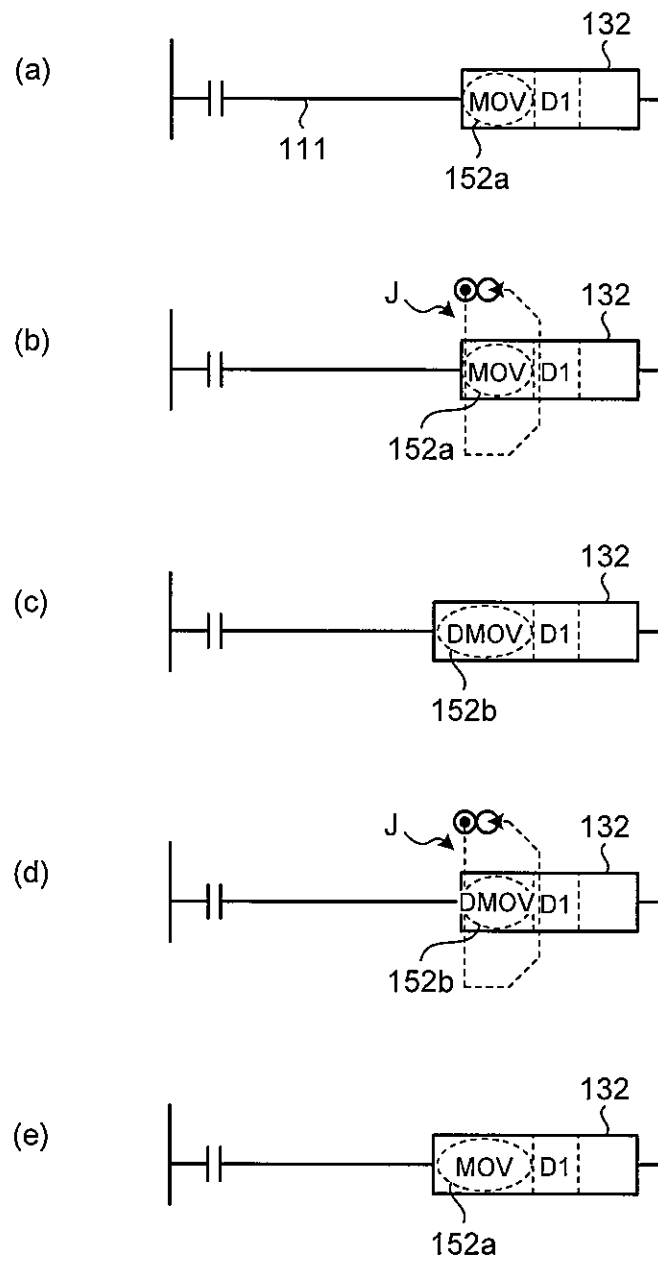


FIG.48

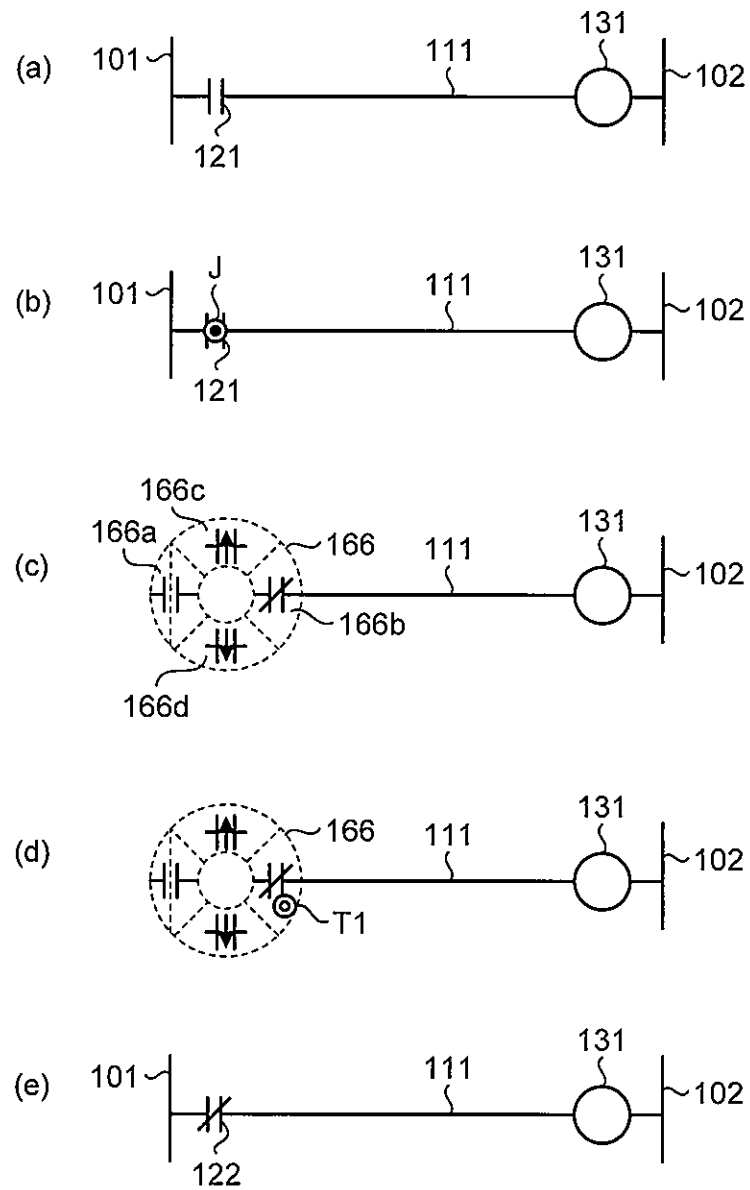


FIG.49

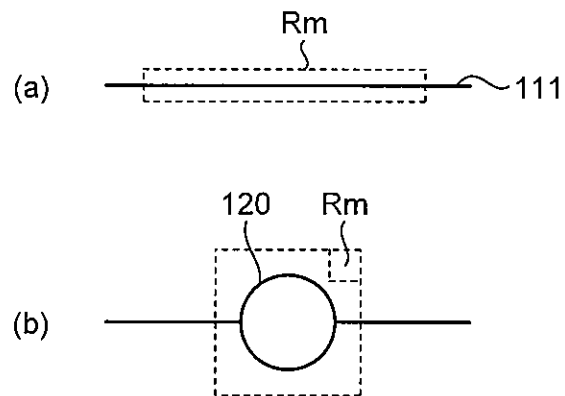


FIG.50

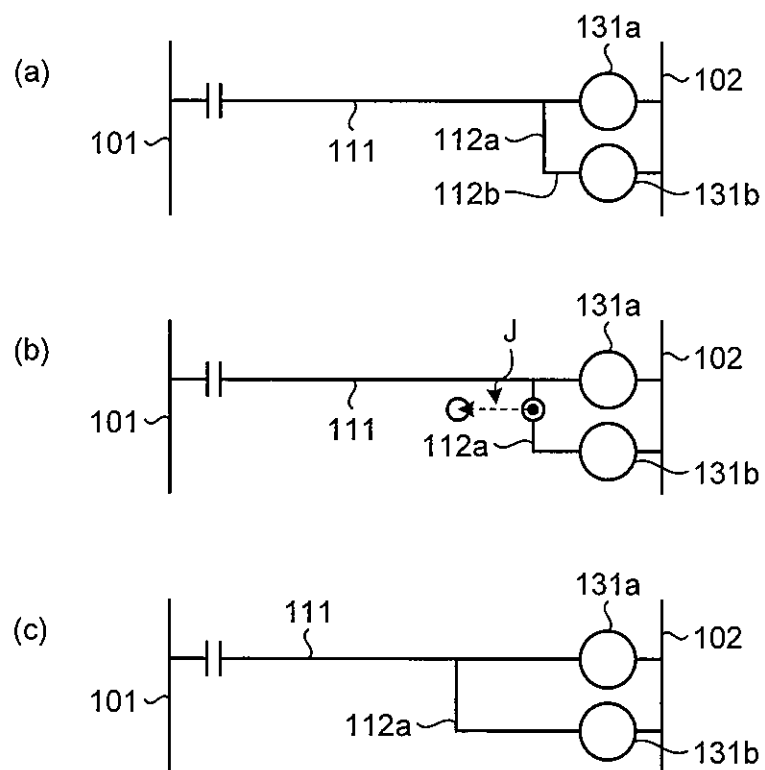


FIG.51

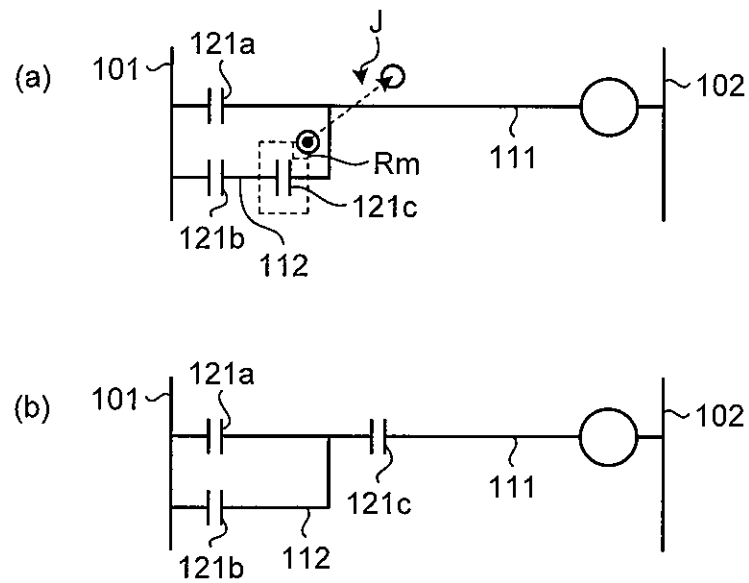


FIG.52

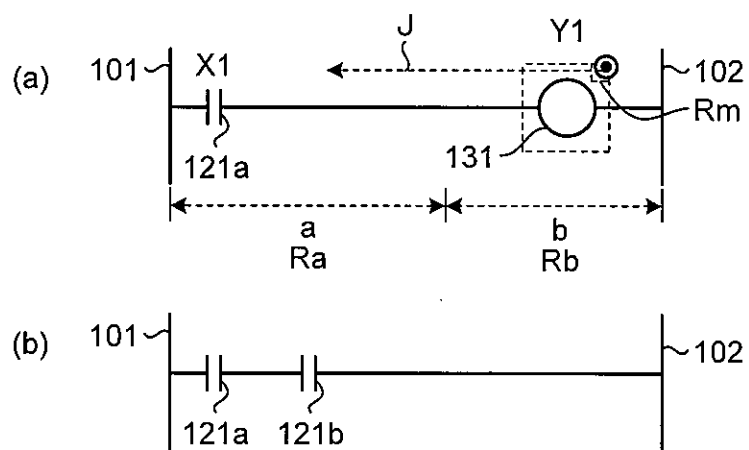


FIG.53

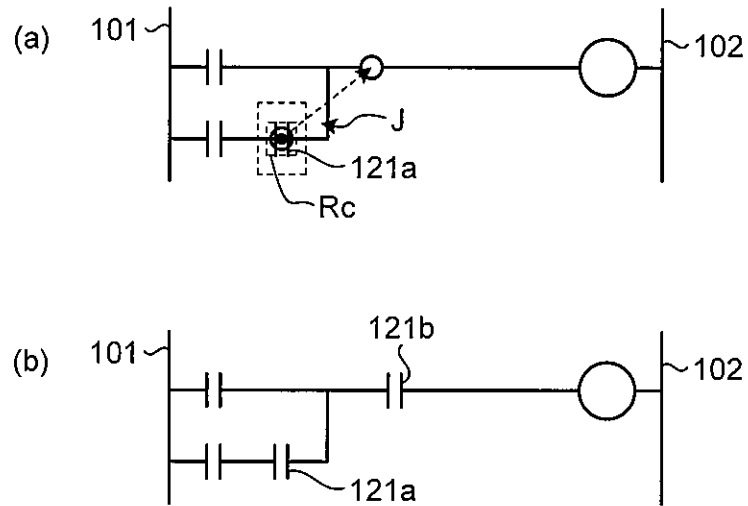


FIG.54

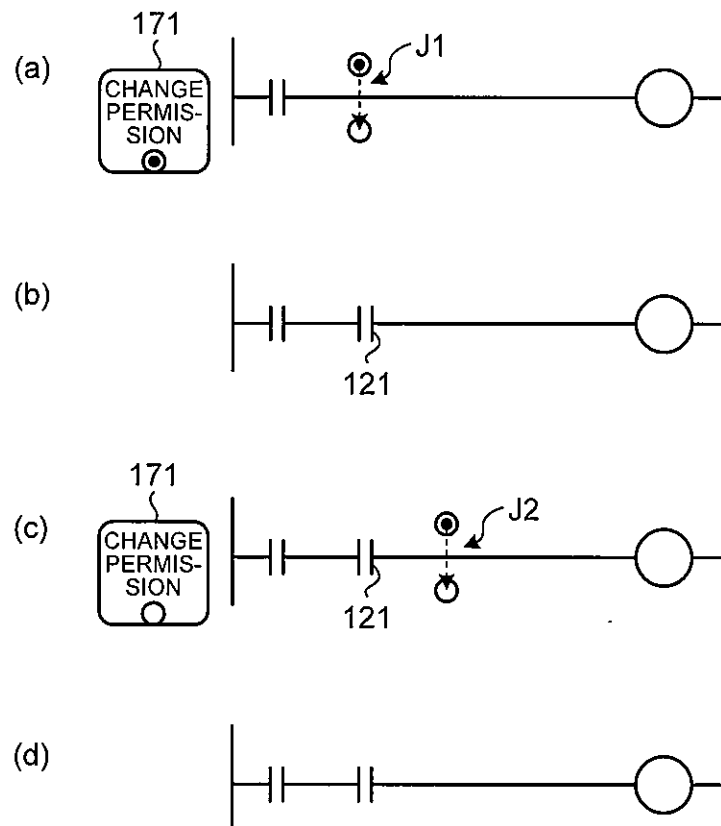


FIG.55

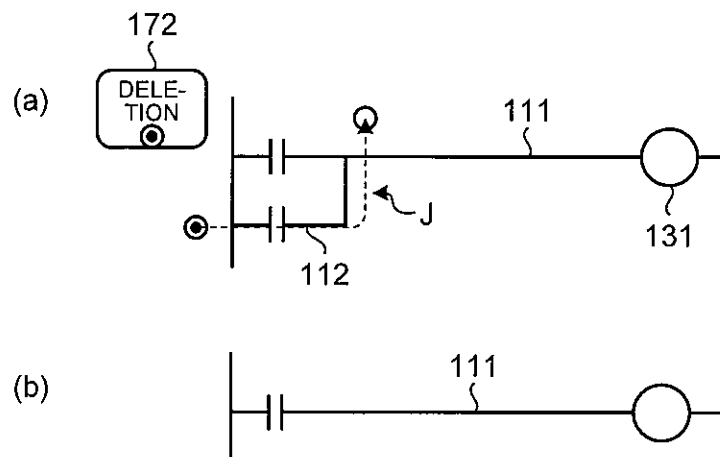


FIG.56

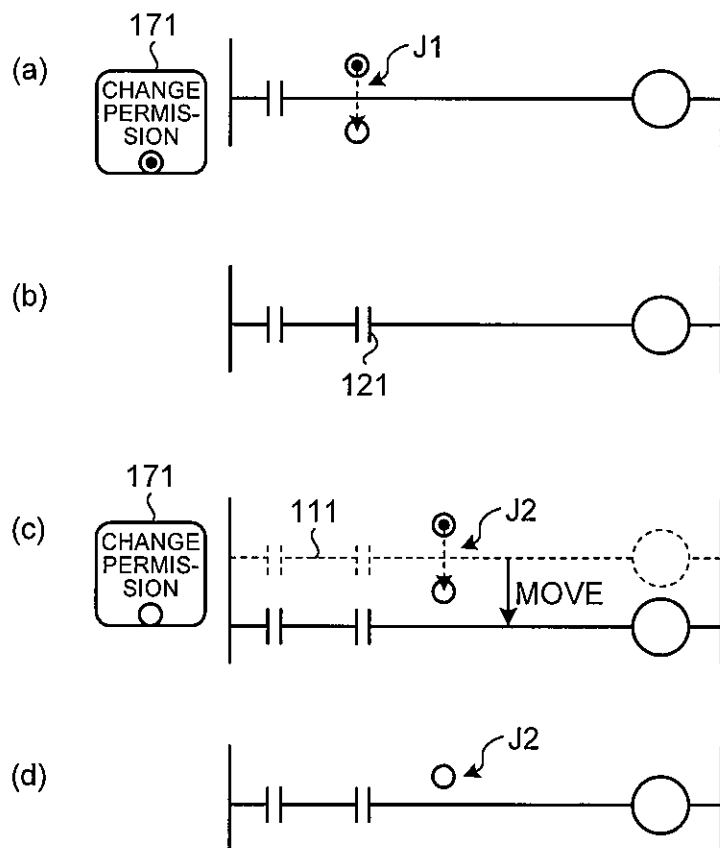


FIG.57

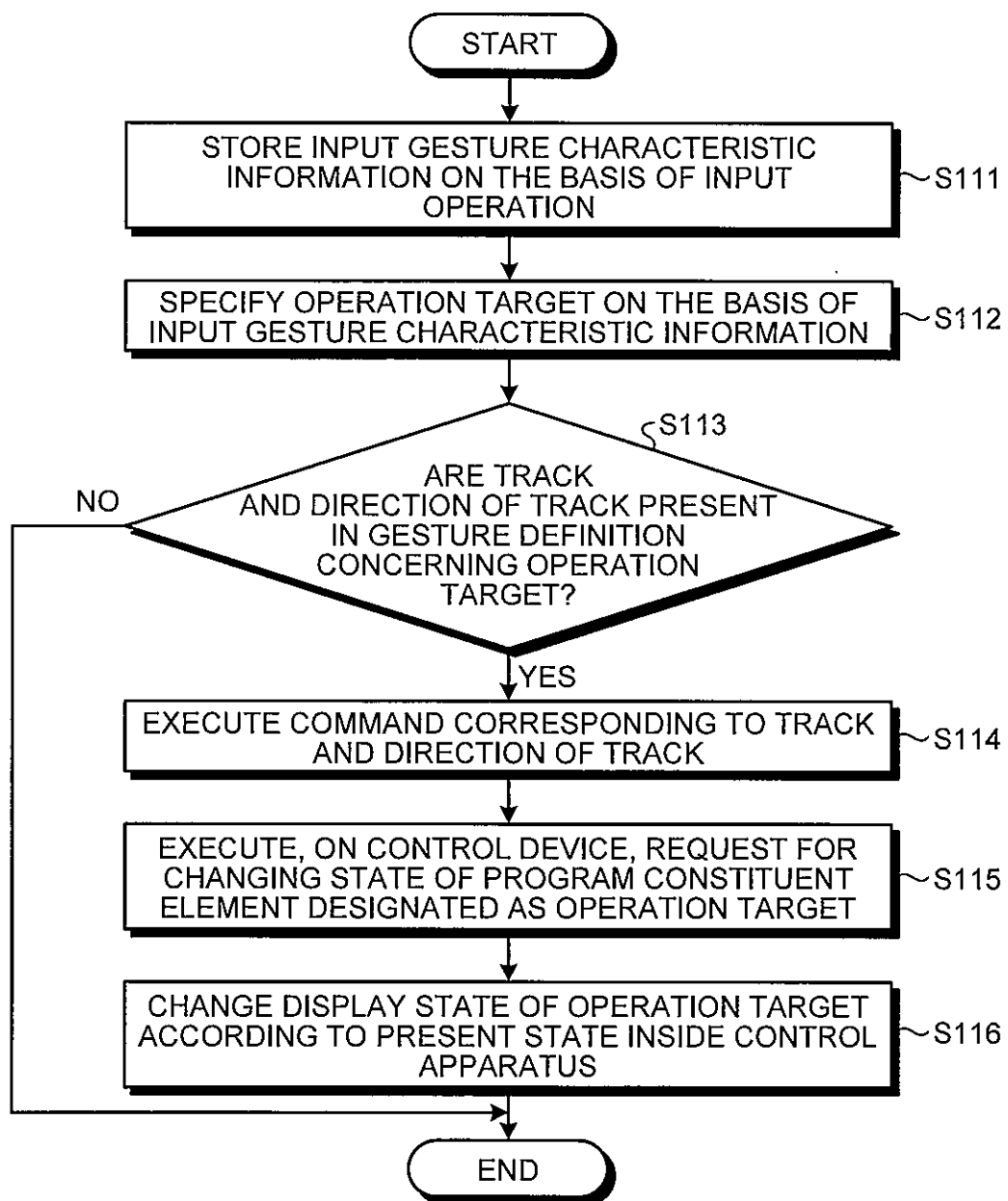


FIG.58

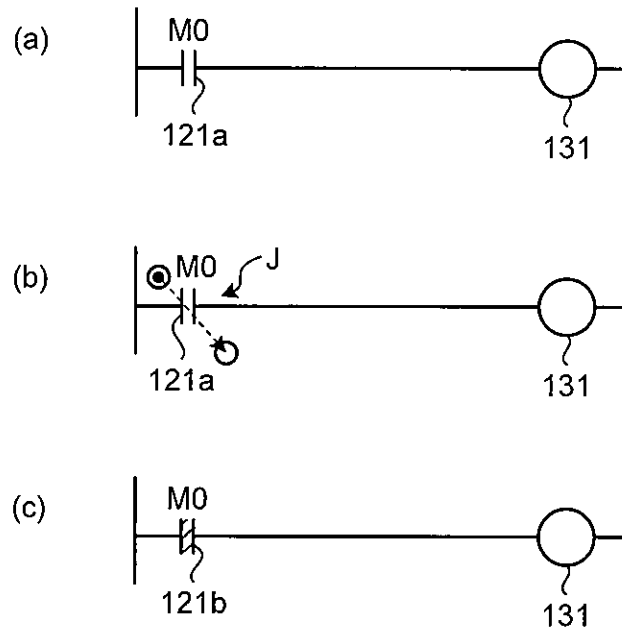


FIG.59

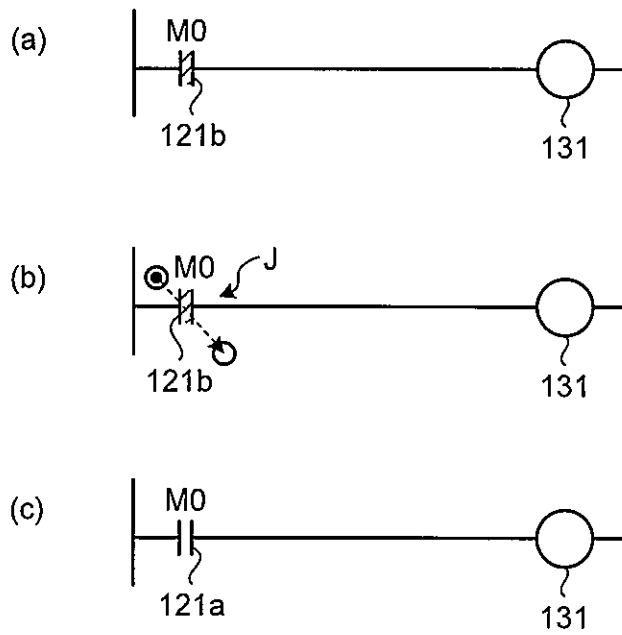


FIG.60

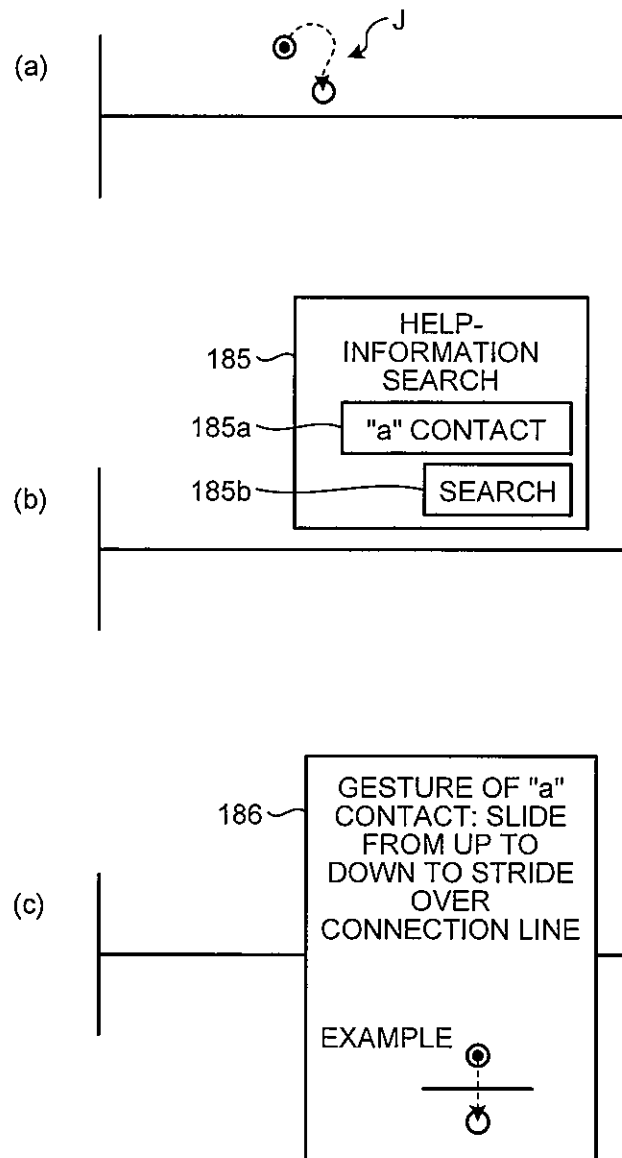


FIG.61

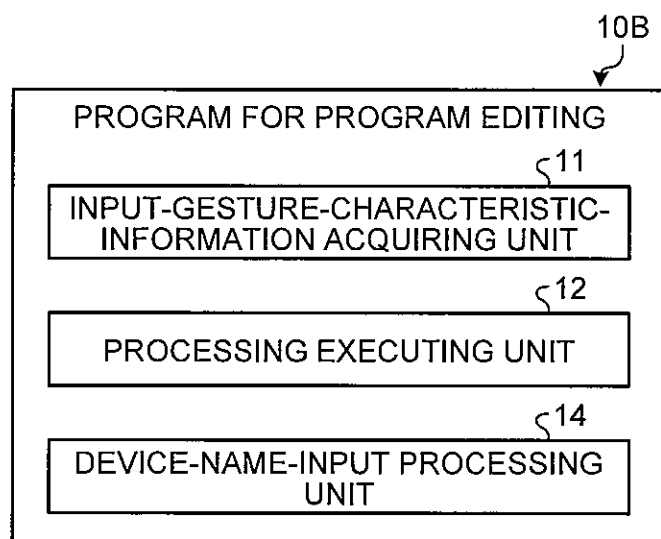


FIG.62

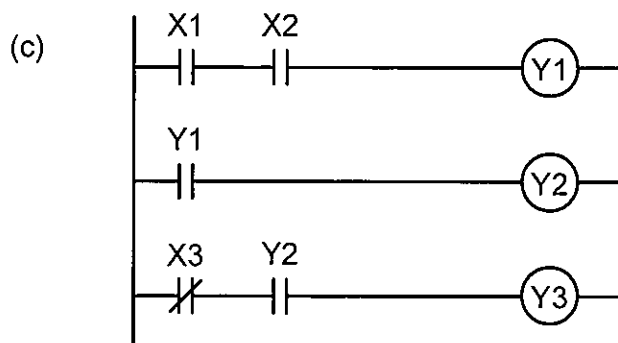
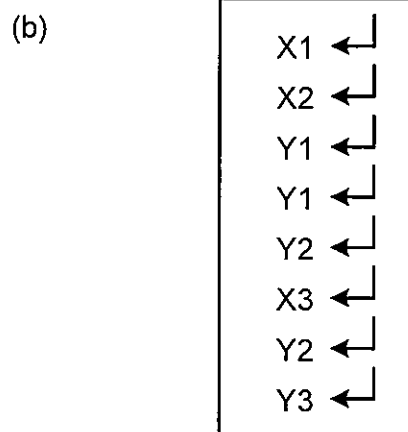
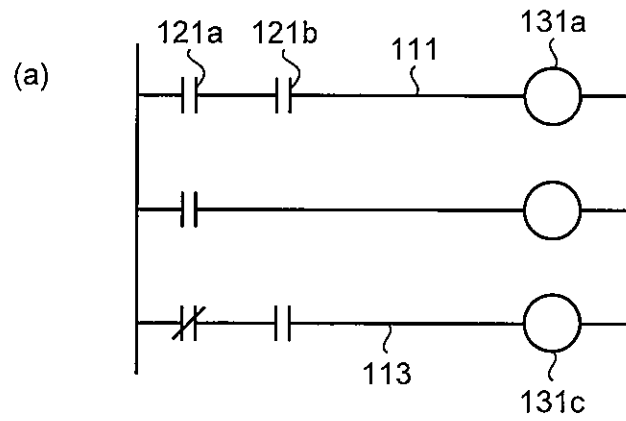


FIG.63

